

Section 1: GENERAL ANATOMY

■ CHAPTER 1: INTRODUCTION

Short Answer			
1. Four important criteria of anatomical position of the human body.	10	4	D01

■ CHAPTER 2: SKELETON

Short Essays			
1. Classify the bones and explain the components of the long bone.	49, 64	33	J14
2. Classification of bones.	49	33	D16
3. Sesamoid bone.	55	36	D03
4. Epiphyses—definition, types and examples.	64	40	D09(RS2), J05, J08
5. Blood supply of a long bone.	67	37	D06, J11
Short Answers			
1. Classification of bones.	49	33	J99
2. Define pneumatic bones with example. Mention its functional significance.	52	36	J98
3. Sesamoid bone—features, examples.	55	36	D00, J06, D09, J12
4. Name the types of lamellae in compact bone.	59	33	D02
5. Growing end of long bone.	64	40	D05(RS2)
6. What are the types of epiphysis? Define each with example.	64	40	J98, J01, D04
7. Epiphysis.	64	40	J07(RS2), J14(RS3), D98
8. Metaphysis.	65	34	D98
9. Atavistic epiphysis.	65	40	J03
10. Traction epiphysis.	65	40	D03
11. Blood supply of long bone.	67	37	D07(RS2)
12. Laws of ossification.	71	38	J11(RS2), D99, J00, J04
13. Types of cartilages with examples.	75	32	J15
14. What are the features of fibrocartilage?	76	32	D06(RS2)

Contd...

Contd...

■ CHAPTER 3: JOINTS

Short Essays

1. Classification of joints.	87	43	J08(RS2)
2. Classify joints. Discuss the components of the synovial joints.	87, 97	43, 46	D13
3. Classification of cartilaginous joints.	94	46	J98
4. Features of a typical synovial joint.	97	46	J05(RS2), J09

Short Answers

1. Classify fibrous joints and give examples for each.	91	44	J14
2. Fibrous joint (types).	91	44	D15(RS3), J99, J10
3. Sutural joints.	91	44	D08
4. Syndesmoses.	93	45	J07, J09
5. Cartilaginous joint.	94	46	D12(RS3)
6. Synchondrosis (primary cartilaginous joint).	94	46	D07
7. Symphysis (secondary cartilaginous joint).	95	46	J08
8. Define symphysis and give any two examples.	95	46	D11
9. Structural features of typical synovial joint.	97	46	J07, D07
10. Classify synovial joint with examples of each type.	98	48	J13(RS3), J01, D04
11. Name any two hinge joints.	99	48	J06
12. Mention two examples of pivot joints.	100	48	D05
13. Hilton's law.	111	—	J03

■ CHAPTER 4: MUSCLES

Short Answers

1. Bursa and its functions.	—	20	J06(RS2), J00, D00
2. What is the difference between a multipennate muscle and a strap muscle?	134	26	D05
3. Give the types of pennate muscles with one example of each.	135	26	D10, D14
4. Bipennate muscle.	135	26	D07
5. Prime movers with examples.	150	28	J17(RS3)

Contd...

Contd...

BDCGA IBSANT1

CHAPTER 5: CARDIOVASCULAR SYSTEM

Short Answers

1. Collateral circulation. — 65
2. Name various types of capillaries and sites where they are present. 172 66
3. End arteries—definition and examples. 178 65

J14(RS3), D08
D10(RS2), D07
D16(RS3), D08,
J08, D15

CHAPTER 6: LYMPHATIC SYSTEM

None

CHAPTER 7: NERVOUS SYSTEM

Long Essay

1. Draw and label a typical spinal nerve. What is its distribution and applied anatomy? — 60

J00

Short Answers

1. Define a spinal segment. — —
2. Draw and label part of a multipolar neurons. 213 54
3. Give any four differences between axon and dendrite. 213 54
4. Types (classification) of neurons. 214 55
5. Name any two types of synapses and two neurotransmitters. 215 56
6. Mention the types of neuroglia giving examples. 215 57

D99, D06, J08
D05(RS2), D99,
J04
J01, D02, D04

D03

D00

J02, D06

CHAPTER 8: SKIN AND FASCIAE

Short Essay

1. Interosseus membrane. 267 —

J08(RS2)

Short Answers

1. Name the appendages of skin. 253 17
2. Give any six functions of skin. 259 18
3. Enumerate the functions of interosseous membrane. 267 —

D01, J06

D11

D11

CHAPTER 9: CONNECTIVE TISSUE, LIGAMENTS AND RAPHE

Short Answers

1. Name the components of the connective tissue. 273 —
2. Connective tissue fibers. — J13
3. Name the types of connective tissues giving examples. 274 —
4. Cells of connective tissue. 274 —

D18(RS3)

D00

J11(RS2)

Contd...

Anatomy

15

Contd...

BDC Vol: 1 IBSANT1

Section 2: UPPER LIMB

CHAPTER 10: INTRODUCTION

None

CHAPTER 11: BONES OF UPPER LIMB

Short Essays

1. Coracoid process of scapula. 9 98 D01
2. Upper end of humerus. 13 102 J06(RS2)

Short Answers

1. Mention peculiarities of the clavicle. 6 95 J98, D99
2. Muscles attached to clavicle. 7 95 J05
3. Name ligaments attached to clavicle. 7 — J02
4. Coracoid process. 9 98 J15(RS3), D18(RS3), D00
5. Name muscles attached to medial border of scapula. 9 98 D00
6. Attachments to coracoid process of scapula. 9 100 J00, J01, D04, D05, J11, D16
7. Bicipital groove of humerus and structures attached. 13 103 J98, J05, D06, J08, D08
8. Surgical neck of humerus and structures related to it. 13 103 D05(RS2), J06
9. Radial groove (spiral groove). 14 103 J99, D03
10. Name the muscles arising from posterior surface of shaft of ulna. 22 112 D08
11. Name the carpal bones. 25 114 J13(RS3)
12. Pisiform bone. 25 115 D02

CHAPTER 12: PECTORAL REGION

Long Essay

1. Describe the female mammary gland under the following headings: (a) Extent/position, (b) Structure, (c) Relations, (d) Blood supply, (e) Lymphatic drainage, (f) Nerve supply, (g) Applied anatomy, and (h) Development. 36 124 J09(RS2), D14(RS3), J15(RS3), D18(RS3)

Short Essays

1. Mammary gland—blood supply, lymphatic drainage and applied anatomy. 38 124 D06(RS2), J08(RS2), J17(RS3), D17(RS3), D98, D07

Contd...

Contd...		BDC Vol: 1 IBSANT1	
2. Pectoralis major.	44	121	D14(RS3) ✖
3. Pectoralis minor.	44	121	D13(RS3), ✖ D17(RS3)
4. Clavipectoral fascia—extent, attachments and structures piercing it.	45	120	J07(RS2), ✖ D11(RS3), J13(RS3), J99, J00, J06
5. Serratus anterior—attachments, nerve supply and actions.	45	121	J10(RS2), D02, D05, D14
Short Answers			
1. Retromammary space.	37	124	D06
2. Peau d'orange.	41	130	D09
3. Clavipectoral fascia.	45	120	J11(RS2) ✖
4. Structures piercing clavipectoral fascia.	45	120	D00, J03, D06, D08, J10
5. Winging of scapula and how it is produced?	47	124	J98
CHAPTER 13: AXILLA			
Long Essays			
1. Describe the axillary artery under the following headings: (a) Beginning and termination, (b) Relations, (c) Branches, and (d) Applied anatomy.	50	134	J07(RS2), D01, J15
2. Describe the brachial plexus under the following headings: (a) Formation, (b) Parts (Roots, trunks, cords), (c) Relations, (d) Branches and distribution, (e) Applied anatomy. Add a note on carpal tunnel syndrome/Add a note on Erb's paralysis.	56	138	D06(RS2), J08(RS2), ✖ J12(RS3), D15(RS3), J10, D99, D03, D11, D15
Short Essays			
1. Axillary artery—extent, relations and branches.	50	134	J10(RS2), ✖ J11(RS2), D09
2. Axillary lymph nodes.	55	137	J11, D14
3. Describe the formation and branching pattern of the brachial plexus.	56	138	D08, D13
4. Lateral cord of brachial plexus.	57	139	D06
5. Erb's point and its applied anatomy (Erb-Duchenne's paralysis).	59	142	J05(RS2), ✖ J14(RS3), D98, D09

Contd...

Contd...

BDC Vol: 1 IBSANT1	
Short Answers	
1. Structures forming anterior wall of axilla.	49 132 D05
2. Contents of axilla.	49 133 J10(RS2) ✖
3. Branches of axillary artery (2nd part and 3rd part).	53 135 J05(RS2), J01, D04, D05, J06, D13
4. Long thoracic nerve.	58 139 J06
5. Branches of medial cord of brachial plexus.	58 140 D00, J14, J15
6. Branches of posterior cord of the brachial plexus.	58 140 D16(RS3) ✖
7. Erb's point—Formation.	59 142 J13(RS3), D16
8. Erb's paralysis.	59 142 J01, D04
9. Klumpke's paralysis.	59 142 J08
CHAPTER 14: BACK	
Short Essays	
1. Trapezius muscle.	65 147 D14(RS3) ✖
2. Rhomboideus major muscle.	65 148 D17(RS3) ✖
Short Answer	
1. Nerve supply and actions of trapezius muscle.	65 147 J12(RS3), J03
CHAPTER 15: SCAPULAR REGION	
Long Essay	
1. Describe the root value, formation course, relations and branches of axillary nerve. Give its applied anatomy. What are effects of injury at surgical neck of humerus?	75 155 J99, D07
Short Essays	
1. Deltoid muscle—location, attachments, nerve supply and action.	70 150 J08(RS2), ✖ D13(RS3), D18(RS3), J00, D01, J05, J06
2. Structures under cover of deltoid muscle.	71 152 J16(RS3), ✖ J18(RS3)
3. Rotator cuff of shoulder.	73 153 J15(RS3), D10, J15

Contd...

Contd...

BDC Vol: 1 IBSANT1

4. Describe the boundaries and contents of the intermuscular spaces in the upper limb (quadrangular and triangular spaces).	75	154	J09(RS2), J02, D04, J07, D13
5. Axillary nerve (circumflex nerve).	75	155	J14(RS3), J98, J12
6. Anastomosis around scapula.	76	156	J12
Short Answers			
1. Nerve supply and action of deltoid.	70	150	D03, J13
2. Rotator cuff (muscles forming it).	73	153	J09(RS2), J18(RS3), D16, D11(RS3), J14
3. Boundaries and contents of the inferior triangular intermuscular space in the arm.	75	154	
4. Axillary nerve in relation to surgical neck of humerus.	75	155	D14(RS3)

CHAPTER 16: CUTANEOUS NERVES, SUPERFICIAL VEINS AND LYMPHATIC DRAINAGE

Short Essays

1. Venous drainage of upper limb.	82	88	D06
2. Cephalic vein.	83	88	J12(RS3)

Short Answers

1. Supraclavicular nerve.	78	119	D05
2. Cutaneous innervation of dorsum of hand.	79	86	J98, J03
3. Cutaneous nerve supply of ring finger—diagram only.	80	—	D15(RS3)
4. Cephalic vein.	83	88	J13(RS3), D13(RS3), D17(RS3)
5. Basilic vein—commencement, termination and tributaries.	83	89	D99
6. Median cubital vein—connection and applied importance.	84	89	J18(RS3), D13, D15

CHAPTER 17: ARM

Long Essay

1. Describe the origin, root value, course, relations, branches and applied anatomy of radial nerve (till it reaches elbow).	101	166	D00, J02, J04, D05
--	-----	-----	--------------------

Contd...

Contd...

BDC Vol: 1 IBSANT1

Short Essays

1. Biceps brachii muscle—attachments, nerve supply and actions.	91	159	D05(RS2), D99, J08
2. Musculocutaneous nerve—root value, origin, relations, course, branches.	92	164	J08, J09, J10
3. Brachial artery.	94	162	J06(RS2), D02, J07
4. Anastomosis around elbow joint.	95	—	D06(RS2), D99
5. Cubital fossa—boundaries and contents.	97	169	J07(RS2), D09(RS2), J16(RS3), D98, J08

Short Answers

1. Events at insertion of coracobrachialis.	90	—	J00
2. Coracobrachialis.	91	159	J15
3. Biceps brachii muscle (attachments, nerve supply and actions).	91	159	J14
4. Brachialis—attachments, nerve supply and action.	91	159	J04
5. Musculocutaneous nerve (muscles supplied).	92	164	J11(RS2), D11
6. Branches of brachial artery.	95	162	D03
7. Cubital fossa—boundaries, contents and clinical applications (neat labeled diagram).	97	169	D12(RS3), J99, J05, J06, D10, D14
8. Radial nerve in spiral groove.	98	167	D17(RS3)
9. Saturday night palsy.	101	143	J04, J05, D05
10. Wrist drop.	102	167	D06(RS2), D99, J03, J06
11. Branches of profunda brachii artery.	102	162	J09

CHAPTER 18: FOREARM AND HAND

Long Essays

1. Describe the ulnar nerve in the palm under the following headings: (a) Root value, (b) Relations, (c) Branches of distribution, and (d) Applied anatomy.	127	207	J05(RS2), D14
---	-----	-----	---------------

Contd...

Contd...

BDC Vol: 1 IBSANT1

2. Name the spaces in the palm. Describe the boundaries of midpalmar space. Add a note on its applied anatomy. 132 212 D09(RS2)

Short Essays

1. Flexor digitorum superficialis muscle. 107 177 J02, D04
 2. Radial artery—origin, termination, course, relations and branches. 111 202 D05, J14
 3. Flexor retinaculum of hand. 116 182 D05(RS2), D12(RS3), D15(RS3), D99
 4. Palmar aponeurosis. 117 183 J00
 5. Lumbricals—attachments, nerve supply, action and applied importance. 123 189 D16(RS3), D18(RS3), J04, J13, D16
 6. Interossei of hand. 123 189 J13(RS3) ✕
 7. Superficial palmar arch—position, formation and branches. 123 203 D13(RS3), J14
 8. Deep palmar arch. 126 204 D10
 9. Ulnar nerve in hand. 127 207 J06(RS2), J18(RS3), D98
 10. Median nerve in palm (hand). 128 205 J10(RS2), D10(RS2)
 11. Carpal tunnel syndrome. 130 183 J01, D08, D11
 12. Boundaries and contents of the midpalmar space. 133 212 D05
 13. Anatomical snuff box—boundaries and contents. 136 197 D09, D11
 14. Extensor reticulum of wrist/hand. 135 198 J10(RS2), D10(RS2), J18(RS3), J07
 15. Supinator muscle. 138 196 D09(RS2) ✕
 16. Posterior interosseous nerve. 139 211 J01
- Short Answers**
1. Pronator teres muscles. 107 177 J99
 2. Flexor digitorum profundus—nerve supply and action. 110 177 D09

Contd...

Contd...

BDC Vol: 1 IBSANT1

3. Anterior interosseous artery. 112 201 J16(RS3)
 4. Flexor reticulum of hand—attachments/structures passing superficial/structures passing deep (through carpal tunnel). 116 182 J09(RS2), J10(RS2), J11(RS2), J00, D00, J05, J09, D12, D14, J15, D15
 5. Palmar aponeurosis. 117 183 J11(RS2), J13(RS3), J16(RS3)
 6. Dupuytren's contracture. 117 184 D06
 7. Name the hypothenar muscles and their nerve supply. 119 186 D15
 8. Muscles of hypothenar eminence. 119 186 J05(RS2), D08(RS2) ✕
 9. Adductor pollicis. 123 186 D12(RS3), J15(RS3)
 10. Lumbricals of hand—nerve supply, actions. 123 189 J06(RS2), J08(RS2), D11(RS3), J05, D10, J11, D13
 11. Superficial palmar arch. 123 203 D08(RS2)
 12. Nerve supply of dorsal interossei of hand. 124 189 J10
 13. Deep palmar arch. 126 204 D07(RS2)
 14. Claw hand. 128 209 D09(RS2), J11(RS2), D02, J04
 15. Ulnar claw hand. 128 209 D12
 16. Median nerve in carpal tunnel. 128 205 D13(RS3), J16(RS3)
 17. Fascial spaces of hand. 132 212 D06(RS2)
 18. Midpalmar space. 133 212 D05(RS2)
 19. Anatomical snuff box. 136 197 J17(RS3)
 20. Dorsal digital expansions—components. 137 195 J17(RS3), J00, D02, D15
 21. Posterior interosseous artery. 140 201 D14(RS3)

Contd...

Contd...

BDC Vol: 1 IBSANT1

■ CHAPTER 19: JOINTS OF UPPER LIMB

Long Essays

- | | | | |
|---|-----|-----|--|
| 1. Describe the shoulder joint under the following headings: (a) Type and subtype, (b) Formation/articular ends, (c) Capsule and ligaments, (d) Relations, (e) Movements and muscles producing them, (f) Blood supply, (g) Nerve supply. Add a note on applied anatomy. | 146 | 219 | J10(RS2),
D12(RS3),
D16(RS3),
J17(RS3), J01,
J03, J11, J12,
D12, J13, D16 |
| 2. Describe the elbow joint under the following headings: (a) Formation, (b) Ligaments, (c) Movements, (d) Blood supply, and (e) Applied anatomy. | 151 | 226 | J16(RS3) |
| 3. Describe the first carpometacarpal joint of hand. | 161 | 234 | D10(RS2) |

Short Essays

- | | | | |
|---|-----|-----|---|
| 1. Scapular movements. | 144 | 218 | J07(RS2) |
| 2. Describe the articular surfaces, ligaments, movements of the shoulder joint. | 146 | 219 | J14 |
| 3. Abduction and adduction movements at shoulder joint. | 148 | 222 | D06 |
| 4. Radioulnar joints. | 155 | 229 | J09(RS2), J98,
D03 |
| 5. <u>Supination and pronation</u> | 157 | 231 | D08(RS2),
J11(RS2),
J18(RS3), D02,
J10 |
| 6. Movements of wrist joint. | 159 | 232 | D07(RS2),
D11(RS3) |
| 7. First carpometacarpal joint of thumb. | 161 | 234 | J07 |
| 8. Movements of thumb and muscles producing them. | 162 | 234 | D08, J09 |

Short Answers

- | | | | |
|---|-----|-----|-----------------------|
| 1. Coracoclavicular ligament. | 144 | 216 | D09(RS2) |
| 2. Coracoacromial arch—attachments and functions. | 145 | 221 | D06(RS2) |
| 3. Glenohumeral ligaments. | 147 | 220 | D07(RS2),
J12(RS3) |
| 4. Radioulnar joint. | 155 | 229 | D07(RS2) |
| 5. Functions of interosseous membrane. | 157 | — | D99 |

Contd...

Contd...

BDC Vol: 1 IBSANT1

- | | | | |
|--|-----|-----|----------|
| 6. Muscles responsible for pronation and supination (supinators and pronators) and their nerve supply. | 157 | 231 | D00, D15 |
| 7. Muscles supinating forearm with their nerve supply. | 157 | 196 | D07 |

■ CHAPTER 20: MISCELLANEOUS

Long Essays

- | | | | |
|--|-----|----------|-----|
| 1. Describe the formation, branches, distribution and applied anatomy of median nerve. | 180 | 165, 205 | D10 |
| 2. Describe the origin, course, relations and distribution of the ulnar nerve. Add a note on its applied anatomy (related to its damage in forearm). | 181 | 165, 207 | J06 |

Short Answer

- | | | | |
|---|-----|----------|----------|
| 1. Root value and muscles supplied by the radial nerve. | 179 | 166, 210 | J14(RS3) |
|---|-----|----------|----------|

BDC
Vol: 1

IBSANT2

Section 3: THORAX

■ CHAPTER 21: INTRODUCTION

Short Essays

- | | | | |
|---|-----|----|---------------|
| 1. Sternal angle—location, events occurring, clinical importance. | 195 | 22 | J04, J07, J12 |
| 2. Suprapleural membrane. | 199 | 32 | D07(RS2) |

Short Answers

- | | | | |
|--|-----|----|---|
| 1. <u>Sternal angle</u> —its importance and events occurring. | 195 | 22 | J06(RS2),
D06(RS2),
J11(RS2),
D13(RS3),
J18(RS3), J98,
D02 |
| 2. <u>Suprapleural membrane</u> (Sibson's fascia)—attachments. | 199 | 32 | J13(RS3), J07,
D16 |

■ CHAPTER 22: BONES AND JOINTS OF THORAX

Short Essay

- | | | | |
|---------------|-----|----|----------|
| 1. First rib. | 206 | 20 | D06(RS2) |
|---------------|-----|----|----------|

Contd...

Contd...

BDC Vol: 1 IBSANT2

Short Answers

1. Xiphisternal joint.	—	27	D16
2. First rib (peculiarities/atypical features, structures related).	206	20	J07(RS2), J15(RS3), J17(RS3), J03
3. Cervical rib.	209	23	D09
4. Name the muscles attached to sternum.	210	17	J15
5. Identify features of typical thoracic vertebra.	213	11	D03, D06, J13

CHAPTER 23: WALLS OF THORAX**Long Essay**

1. Describe course, branches and distribution of typical intercostal nerve.	226	43	J07(RS2)
---	-----	----	----------

Short Essays

1. First intercostal space.	—	32	J03
2. Typical intercostal space—boundaries and contents.	—	32	D08(RS2), J16(RS3), D18(RS3), J08, J15
3. Typical intercostal nerve—course, relations and branches	226	43	J05(RS2), J17(RS3), D06, D00
4. Azygos system of veins—definition, labeled diagram and applied anatomy.	232	42	D05
5. Azygos vein (vena azygos).	232	42	D10(RS2), D13(RS3), D14(RS3), J99, J09, D14

Short Answers

1. Contents of a typical intercostal space.	—	—	D98, D16
2. Superior intercostal artery.	—	40	J09
3. Anterior intercostal membrane.	225	33	J11
4. External intercostal muscle.	225	33	J08(RS2)
5. Typical intercostal nerve (branches).	226	43	D06(RS2), J13
6. Enumerate the contents of costal groove with their relations (order and name of structures in costal groove).	227	19	D99, D14

Contd...

Anatomy

Contd...

BDC Vol: 1 IBSANT2

7. Azygos vein—level, formation, termination and tributaries.	232	42	D02, J11, D11, J15
---	-----	----	--------------------

CHAPTER 24: THORACIC CAVITY AND PLEURAE**Short Essays**

1. Pleura.	239	54	D10
2. Pleural recesses—location, events occurring, clinical importance.	242	58	J07(RS2), J12(RS3), J16(RS3), J98, J04, D12

Short Answers

1. Pulmonary ligament and its function.	242	—	D12(RS3), D99, D06
2. Pleural recess and its role.	242	58	J03
3. Costodiaphragmatic recess.	242	58	D16

CHAPTER 25: LUNGS**Long Essays**

1. Describe the lungs under the following headings: (a) Labeled diagram of mediastinal surfaces showing position of related structures including structures in both hila, (b) Development, (c) One congenital malformation.	246	65, 63	D05
2. Define bronchopulmonary segments. Name the bronchopulmonary segments present in the left lung and add a note on its applied aspects. Draw a labeled diagram of the medial surfaces of both lungs.	252	68	D05(RS2)

Short Essays

1. Right lung.	246	64	D12(RS3)
2. Mediastinal surface of lung.	247	64	D18(RS3)
3. Mediastinal surface of left lung with the aid of diagram.	248	66	D07(RS2), D10(RS2), J99
4. Mediastinal surface of right lung with the aid of diagram.	248	65	J08(RS2), J06
5. Root of right lung—relations and structures forming it.	248	67	D06(RS2)
6. Hilum of lungs.	249	64, 66	D00

Contd...

Contd...

BDC Vol: 1 IBSANT2

7. List the differences between right and left lung.	249	65	J13
8. Bronchopulmonary segments (of left/right lung).	252	68	J06(RS2), J11(RS2), D14(RS3), J17(RS3), J00, J02, D04, D08, J11, D11, D15, D16

Short Answers

1. Draw a neat labeled diagram of medial surface of left lung.	248	66	D15(RS3)
2. Root of lung (right)—contents.	248	67	D17(RS3), J98, D15
3. Hilum of right lung (structures present).	249	64	J09(RS2), D98
4. Hilum (root) of left lung.	249	66	D03, J04
5. Blood supply of lungs.	249	70	D09(RS2), J10
6. Mention the lymphatic drainage of lungs.	250	71	D10
7. Draw and label hilum/root of right lung.	250	65	D11, D14
8. Differences between right and left principle bronchus and its clinical significance.	251	61	D03
9. Define a bronchopulmonary segment.	252	68	J03
10. Bronchopulmonary segments of left lung (upper lobe).	252	68	J04, J09

CHAPTER 26: MEDIASTINUM**Long Essay**

1. Define mediastinum. Mention the contents of posterior mediastinum. Describe the thoracic part of esophagus. Add a note on its applied anatomy.	259, 261, 298	49	D08(RS2)
---	---------------	----	----------

Short Essays

1. Division of mediastinum and name the contents of superior mediastinum.	259	50	J11
2. Superior mediastinum—boundaries and contents.	259	50	J09(RS2), J14(RS3), D17(RS3), D08, D14

Contd...

BDC Vol: 1 IBSANT2

3. Posterior mediastinum—boundaries and contents.	261	50	D18(RS3), J99, D03, D07
---	-----	----	-------------------------

Short Answers

1. Superior mediastinum—contents.	260	51	D02, J10, J13
2. Anterior mediastinum—boundaries and contents.	260	53	D11
3. Middle mediastinum—contents.	260	53	J04
4. Posterior mediastinum—contents.	261	53	D07(RS2)

CHAPTER 27: PERICARDIUM AND HEART**Long Essays**

1. Describe right atrium under following headings: (a) Borders and surfaces, (b) Relations, (c) External and internal features including openings, (d) Blood supply and nerve supply, (e) Development including that of interatrial septum, (f) Anomalies.	267	82	J06(RS2), D07(RS2), D13(RS3), D02, D04, J06, D06
2. Describe the external and internal features of the left atrium.	271	83	D13
3. Describe blood supply of heart. Give its applied anatomy. Add a note on development of interatrial septum.	278	93	J11(RS2), D11(RS3), D17(RS3), D98, D99, D12, J14

Short Essays

1. Pericardium—layers and sinuses.	263	76	J06, D15
2. Fibrous pericardium.	263	77	J03
3. Serous pericardium.	264	77	D10(RS2)
4. Pericardial sinuses.	264	77	D14(RS3), J12
5. Transverse sinus of heart.	264	78	J13(RS3)
6. Oblique sinus of pericardium.	265	77	D13(RS3)
7. Sternocostal surface of heart.	267	81	J98
8. Right atrium.	267	82	D09(RS2), D12(RS3)
9. Interior of right atrium.	270	82	J10(RS2), D07, D16
10. Openings of Right atrium.	270	82	J18(RS3)
11. Interatrial septum and its development.	270	84	J05(RS2), D05
12. Interventricular septum.	271	85	D00
13. List the differences in the interior of the right and left atrium.	—	—	J14

Contd...

Contd...	BDC Vol: 1 IBSANT2	
14. Chordae tendinae.	271	86
15. Right coronary artery.	278	93
16. Left coronary artery.	279	94
17. Venous drainage of heart.	280	95
18. Coronary sinus—formation, course and tributaries.	281	110
		D17(RS3), D06(RS2), D12(RS3), D01 D15(RS3), D00 J09(RS2), J15(RS3), D09 J16(RS3), J18(RS3), D98, J01, D03, D10, J11, D11

Short Answers

1. Triangle of Koch.	—	—	D09
2. Pericardial sinuses.	264	77	D18(RS3)
3. Transverse sinus of pericardium.	264	78	D08(RS2), J02
4. Oblique sinus of pericardium (boundaries).	265	77	J04
5. Openings in right atrium.	270	82	J08(RS2), D98, J05
6. Papillary muscles.	271	87	D01
7. Moderator band.	271	87	D13(RS3), D14(RS3)
8. Where are SA and AV nodes located? Give their blood supply.	277	91	J02
9. Name the branches of right coronary artery.	278	93	D14, D16
10. Areas supplied by right coronary artery.	279	94	J05, J13
11. Branches of left coronary artery and parts of heart supplied.	279	94	J03, J10
12. Coronary sinus—termination, tributaries and development.	281	95	J05(RS2), J17(RS3), J98
13. Nerve supply of heart (cardiac plexuses).	282	96	D09(RS2), D01
14. Deep cardiac plexus.	282	126	D15(RS3)

CHAPTER 28: SUPERIOR VENA CAVA, AORTA AND PULMONARY TRUNK

Long Essay

1. Describe arch of aorta under following headings: (a) Situation, (b) Origin, course and termination (extent), (c) Relations and branches (including rare branches), (d) Development and anomalies.	291	102	J05, J08
--	-----	-----	----------

Contd...

Contd...

BDC Vol: 1 IBSANT2

Short Essays

1. Arch of aorta—branches and relations.	291	102	J00, J07, J12, J15
2. Draw and label a cross section of thorax at level of T4.	293	103	D01

Short Answer

1. Arch of aorta—branches.	292	103	D11
----------------------------	-----	-----	-----

CHAPTER 29: TRACHEA, ESOPHAGUS AND THORACIC DUCT

Long Essay

1. Describe thoracic part of esophagus under following headings: (a) Extent, (b) Course and relations, (c) Blood supply and nerve supply, (d) Constrictions, (e) Applied anatomy, (f) Microscopic structure.	298	210	J07, D08
--	-----	-----	----------

Short Essays

1. Trachea—extent, labeled diagram, applied anatomy.	296	59	J06
2. Thoracic duct—extent, length, formation, course, relations, area of drainage and termination.	302	115	D05(RS2), J07(RS2), J13(RS3), J18(RS3), J02, D04, D07, J14

Short Answers

1. Sites of normal constrictions in esophagus and structures compressing it.	298	—	D12(RS3), J03
2. Thoracic duct—commencement and termination.	302	115	D01, J12

CHAPTER 30: MISCELLANEOUS

Diaphragm though part of Paper I is covered in Abdomen section (please refer it there).

BDC Vol: 2 IBSANT1

Section 4: LOWER LIMB

CHAPTER 31: INTRODUCTION

None

CHAPTER 32: BONES OF LOWER LIMB

Short Essays

1. Ischial tuberosity.	12	275	J01
------------------------	----	-----	-----

Contd...

Contd...	BDC Vol: 2 IBSANT1		
2. Greater trochanter of femur.	15	282	J05
3. Patella.	21	287	J13(RS3)
4. Upper end of tibia.	24	289	D00
Short Answers			
1. Greater sciatic notch.	8	274	D14(RS3) -
2. Ischial spine.	12	275	D05
3. Ischial tuberosity—muscles attached.	13	278	D10, D14
4. Define femoral torsion.	15	287	J99
5. Greater trochanter of femur.	15	282	D05(RS2)
6. Lower end of femur.	16	284	J09
7. Linea aspera of femur.	16	283	J11(RS2)
8. Adductor tubercle.	16	284	J03
9. Muscles attached to femur (greater trochanter/linea aspera).	17	285	J07(RS2), J05, J06
10. Medicolegal importance of ossification center to lower end of femur.	21	286	J01, D04, D07
11. Patella (how it differs from other bones and bursae in relation to it).	21, 156	287	J98, J05
12. How do you differentiate left from right patella?	21	287	D16
13. Tibial tuberosity.	24	289	J04
14. Soleal line.	24	290	D03
15. Structures attached to anterior intercondylar area of tibia.	26	290	D08

■ CHAPTER 33: FRONT OF THIGH

Long Essays

1. Describe femoral triangle under following headings: (a) Boundaries, (b) Contents, (c) Applied aspects.	48	307	J13(RS3) ✕
2. Describe femoral artery under following headings: (a) Extent (Origin and termination), (b) Course and relations, (c) Branches, (d) Anastomoses, (e) Applied anatomy.	53	319	J07(RS2), J05 ✕
3. Describe femoral nerve under following headings: (a) Origin, (b) Course, (c) Termination (d) Relations, (e) Branches.	55	326	J03

Contd...

Contd...	BDC Vol: 2 IBSANT1		
Short Essays			
1. Cutaneous nerve supply of front of thigh.	45	262	J14(RS3) ✕
2. Iliotibial tract.	47	306	J18(RS3) ✕
3. Femoral triangle—boundaries and contents.	48	307	D10(RS2), D98, D06, D09, J13, J15
4. Femoral sheath—formation, divisions, contents, applied anatomy.	50	308	D05(RS2), D06(RS2), J08(RS2), D09(RS2), D16(RS3), J99, D00, J04, D05, D08, J14 ✕
5. Femoral canal (applied anatomy).	51	309	J16(RS3) -
6. Profunda femoris artery.	54	321	D11(RS3), ✕ D18(RS3), J98, D99, J12
7. Femoral nerve—root value, course, branches.	55	326	J17(RS3), D07, D11
8. Quadriceps femoris.	57	311	J08(RS2)
9. Adductor canal—boundaries and contents.	60	318	J09(RS2), D09(RS2), ✕ D15(RS3), D17(RS3), D01, J07, J09, J11, D13
Short Answers			
1. House maid's knee.	47	410	J18(RS3)
2. Iliotibial tract.	47	306	J15(RS3), D13
3. Femoral triangle—boundaries, floor, contents and its posterior relations.	48	307	D99, J01, D04, J07
4. Femoral sheath—formation, division, contents and applied anatomy.	50	308	D08(RS2), ✕ J18(RS3), D18(RS3), D04, J07
5. Femoral canal—situation, contents, applied anatomy.	51	309	J17(RS3), ✕ D17(RS3), D07, J09, D14
6. Femoral ring.	51	309	J11
7. Branches (superficial) of femoral artery.	53	320	D14(RS3), J08
8. Profunda femoris artery (branches).	54	321	J06(RS2), ✕ D15(RS3)

Contd...

Contd...	BDC Vol: 2 IBSANT1		
9. Branches of femoral nerve.	56	326	D06(RS2), D09 J98
10. Cutaneous branches of femoral nerve with areas of distribution.	56	326	
11. Sartorius muscle.	58	312	J13(RS3), D08
12. Quadriceps femoris (components and action).	57	311	D13(RS3), J06, D15
13. Rectus femoris.	58	311	D14(RS3)
14. Adductor canal—contents.	60	318	D08(RS2), D98

■ CHAPTER 34: MEDIAL SIDE OF THIGH

Long Essays

1. Name the adductor compartment 63 315 J01, D04
muscles of the thigh (adductors of thigh). Give origin, insertion, morphology, relations, nerve supply, actions and openings and structures passing through the adductor magnus muscle.
2. Describe the (a) formation, (b) course, 65 325 J15
(c) branches, and (d) applied anatomy of obturator nerve.

Short Essays

1. Adductor magnus muscle. 64 315 D06(RS2), D03
2. Obturator nerve—root value, course, 65 325 D08
branches, applied anatomy.

Short Answers

1. Adductor muscles. 64 315 D07(RS2) ✓
2. Nerve supply to adductor muscles. 64 315 J11
3. Adductor longus. 64 315 J14(RS3) ✓
4. Pectineus. 64 315 D05(RS2) ✓
5. Two functional components of adductor 64 315 J99
magnus.
6. Obturator nerve—root value, muscles 65 325 J05(RS2), J07
supplied.
7. Structure supplied by anterior division of 66 325 D99
obturator nerve.

Contd...

Contd...

BDC Vol: 2 IBSANT1

■ CHAPTER 35: GLUTEAL REGION

Long Essays

1. Describe the gluteus maximus muscle 72, 71 330 J16(RS3) ✗
under the following headings: origin, insertion, nerve supply and action. Add a note on structures under cover of gluteus maximus.
2. Enumerate structures under cover of 71, 90 333, 338 D17(RS3)
gluteus maximus. Describe in detail sciatic nerve and its applied anatomy.

Short Essays

1. Gluteus maximus muscle—origin, 72 330 J05, D08
insertion, nerve supply and actions.
2. Gluteus medius and minimus. 72 330 J10(RS2) ✗
3. Piriformis muscle. 72 331 D14(RS3), D98
4. Greater sciatic foramen. 78 279 D02
5. Lesser sciatic foramen—formation and 78 279 J10
structures transmitted.

Short Answers

1. Name glutei muscle and their nerve 72 330 D06(RS2)
supply.
2. Gluteus maximus muscle. 72 330 J08(RS2)
3. Gemelli muscles. 72 331 J11
4. Obturator internus—nerve supply and 72 331 J15(RS3)
action.
5. Draw a neat labeled diagram of structures 74 333 J13(RS3)
under cover of gluteus maximus.
6. Name muscles supplied by superior 76 338 J98, D12
gluteal nerve and mention their actions.
7. Inferior gluteal nerve. 76 338 J14(RS3)
8. Cruciate anastomosis—formation and 78 337 J05(RS2),
applied aspect. J15(RS3), ✗
J18(RS3), J99,
J10
9. Structures passing through greater 78 279 J05(RS2)
sciatic foramen.
10. Name the structures emerging above 78 334 J13, D15
and below the piriformis muscle.

Contd...

Contd...

BDC Vol: 2 IBSANT1

CHAPTER 36: POPLITEAL FOSSA

Long Essay			
1. Describe popliteal fossa under following headings: (a) Boundaries, (b) Contents, (c) Applied anatomy. Describe origin, course and branches of popliteal artery.	81	345	D05(RS2), D12(RS3), D01, D07, J12

Short Essays

1. Lateral popliteal nerve.	—	—	D05
2. Popliteal fossa—boundaries and contents.	81	345	D08(RS2), J05, D12, D14
3. Popliteal artery—origin, termination and branches.	83	346	D05, D11
4. Common peroneal nerve—origin, course and branches.	86	349	D15(RS3), J13, D15

Short Answers

1. Popliteal fossa—boundaries and contents.	81	345	D17(RS3), D04
2. Popliteal artery—branches.	84	347	D09
3. Foot drop.	86	426	D07(RS2), J01, D04

CHAPTER 37: BACK OF THIGH

Long Essays

1. Name hamstrings of thigh. Mention origin, insertion, nerve supply and actions of semimembranosus.	89	341	J06
2. Describe sciatic nerve under following headings: (a) Root value, (b) Origin, (c) Course and relations, (d) Branches, (e) Applied anatomy.	90	338	J05(RS2), D10(RS2), D11(RS3), J02, D09, D10

Short Essays

1. Hamstring muscles.	89	340	D07(RS2), J11(RS2)
2. Sciatic nerve—relations and branches of distribution.	90	338	J15(RS3)
3. Biceps femoris muscle.	90	341	J17(RS3), D99

Short Answers

1. Hamstring muscles—enumerate, nerve supply characteristic features.	89	340	J10, D13
2. Semimembranosus muscle.	90	341	D12(RS3)

Contd...

Contd...

BDC Vol: 2 IBSANT1

CHAPTER 38: FRONT, LATERAL AND MEDIAL SIDES OF LEG AND DORSUM OF FOOT

Long Essay

1. Name dorsiflexors of ankle joint. Mention origin, insertion, nerve supply and action of extensor digitorum longus.	102	356	J07
---	-----	-----	-----

Short Essays

1. Cutaneous nerve supply of dorsum of foot.	99	263	D13(RS3), D14(RS3), D16
2. Retinaculae around ankle joint.	99	354, 367	J11, J15
3. Extensor retinaculum of foot.	100	354	J05(RS2), D07(RS2), D11(RS3)
4. Interosseous membrane of leg—muscles attached.	102	—	J07
5. Deep peroneal nerve.	103	360	D09(RS2)
6. Dorsalis pedis artery—formation, termination, relations and branches.	105	359	D05(RS2), J06(RS2), J08(RS2), D17(RS3)
7. Superficial peroneal nerve.	108	364	D99

Short Answers

1. Great saphenous nerve.	98	326	J05
2. Sensory nerve supply of dorsum of foot.	99	263	J11(RS2), J05, D11
3. Name the structures passing under the extensor retinaculum of foot.	100	355	D15
4. Tibialis anterior.	102	356	J10
5. Muscles supplied by deep peroneal nerve (anterior tibial nerve).	103	360	J02, J08, J14
6. Dorsalis pedis artery (origin and branches).	105	359	D06(RS2), J13(RS3), J05, D13
7. Peroneus longus muscle.	108	363	J10(RS2), J16(RS3), D09
8. Superficial peroneal nerve—muscles supplied.	108	364	D14(RS3)
9. Anserine bursa.	110	405	D08(RS2)

Contd...

Contd...

BDC Vol: 2 IBSANT1

■ CHAPTER 39: BACK OF LEG

Short Essays

- | | | | |
|--|-----|-----|---|
| 1. Flexor retinaculum of foot—attachments, structures passing underneath. | 115 | 367 | J02, D04, J06, J10, J12 |
| 2. Explain the attachments, action and nerve supply of the triceps surae muscle. | 116 | 370 | J13 |
| 3. Popliteus—attachments, nerve supply, action. | 118 | 368 | J06(RS2), D10(RS2), D13(RS3), J98, D02, J04, J06, J03 |
| 4. Peroneal artery. | 120 | 376 | J12(RS3) |
| 5. Tibial nerve. | 120 | 377 | |

Short Answers

- | | | | |
|---|-----|-----|------------------------------|
| 1. Sural nerve (area supplied). | 114 | 427 | D13(RS3), J06 |
| 2. Structures passing deep to flexor retinaculum of foot. | 115 | 367 | D00, J14 |
| 3. Tendocalcaneus. | 116 | 370 | J05(RS2), D09(RS2), J10(RS2) |
| 4. Peripheral heart. | 116 | 371 | J18(RS3) |
| 5. Popliteus muscle—attachments, action and nerve supply. | 118 | 368 | J09(RS2), J09 |

■ CHAPTER 40: SOLE OF FOOT

Short Essays

- | | | | |
|---------------------------------------|-----|-----|----------|
| 1. Plantar aponeurosis. | 124 | 378 | D02 |
| 2. Dorsal interossei muscles of sole. | 130 | 383 | D10 |
| 3. Plantar (arterial) arch. | 131 | 386 | J05, D06 |

Short Answers

- | | | | |
|---|-----|-----|-----|
| 1. Name the muscles supplied by the medial plantar nerve in the sole. | 126 | 387 | D16 |
| 2. Mention the muscles supplied by the lateral plantar nerve. | 129 | 387 | J13 |

■ CHAPTER 41: VENOUS AND LYMPHATIC DRAINAGE; COMPARISON OF LOWER AND UPPER LIMBS

Long Essay

- | | | | |
|--|-----|-----|----------|
| 1. Describe the venous drainage of lower limb with its applied importance. | 134 | 265 | J14(RS3) |
|--|-----|-----|----------|

Contd...

Contd...

BDC Vol: 2 IBSANT1

Short Essays

- | | | | |
|--|-----|-----|---|
| 1. Great saphenous vein/long saphenous vein—origin, course, tributaries and termination. | 135 | 266 | J12(RS3), D13(RS3), D02, D03, J10, D14, D16 |
| 2. Small saphenous vein—formation, course, tributaries. | 136 | 266 | D08 |
| 3. Varicose veins in lower limb. | 137 | 268 | J08 |
| 4. Inguinal lymph nodes—groups, area of drainage and applied importance. | 138 | 268 | J00, D00, D07 |

Short Answers

- | | | | |
|--|-----|-----|--------------------|
| 1. Great saphenous vein (origin, termination, named tributaries). | 135 | 266 | J06(RS2), D01, D12 |
| 2. Veins connected by medial ankle perforators. | 137 | 267 | D11(RS3) |
| 3. Varicose veins. | 137 | 268 | J09(RS2), J99 |
| 4. Inguinal lymph nodes (superficial group). | 138 | 268 | J06(RS2), J09 |
| 5. Areas of drainage of horizontal superficial inguinal lymph nodes. | 138 | 268 | J01, D04 |
| 6. Areas of drainage of popliteal lymph nodes. | 139 | 269 | J07 |

■ CHAPTER 42: JOINTS OF LOWER LIMB

Long Essays

- | | | | |
|--|--------------------|----------|---|
| 1. Describe hip joint under following headings: (a) Type and bones taking part (formation/articular surfaces), (b) Ligaments, (c) Relations, (d) Movements and muscles producing them, (e) Neurovascular supply, (f) Applied anatomy. | 147 | 392 | J12(RS3), J06(RS2), D09(RS2), J17(RS3), J04, J08, J10, J14, D16 |
| 2. Describe knee joint under following headings: (a) Type and bones articulating, (b) Capsule and ligaments, (c) Intra-articular structures (Menisci and cruciate ligaments), (d) Blood supply and nerve supply, (e) Movements and muscles producing them, (f) Locking and unlocking movements, (g) Bursae around knee joint, (h) Applied anatomy. | 152 | 399 | J08(RS2), J18(RS3), D03, D06, D12 |
| 3. Describe intracapsular structures of knee joint. Add a note on locking and unlocking of knee joint. | 155, 157, 401, 407 | J09(RS2) | |

Contd...

Contd...

BDC Vol: 2 IBSANT1

4. Describe ankle joint under following headings: (a) Type, (b) Capsule and ligaments, (c) Relations, (d) Movements and muscles producing them, (e) Blood supply, (f) Applied anatomy.	159	411	J10(RS2), J00, D11
5. Describe inversion and eversion. Name joints in which these movements occur and name muscles producing these movements, with their attachments and nerve supply in a tabulated form.	166	416	J09
Short Essays			
1. Describe the articular surfaces and movements of the hip joint.	147	393	D15
2. Ligaments of hip joint.	148	394	D15(RS3)
3. Iliofemoral ligament—attachments and applied anatomy.	148	394	J05(RS2), J06
4. Abductors of hip joint.	150	396	D16(RS3)
5. Intra-articular structures of knee joint.	155	401	J15
6. Medial ligaments of knee (tibial collateral ligament).	154	401	J02
7. Lateral ligaments of knee.	154	401	D04
8. Cruciate ligaments of knee joint.	155	402	D08(RS2), J17(RS3), D01
9. Semilunar cartilage (medial meniscus).	155	403	D99, D14
10. Movements of knee joint.	156	406	J11
11. Locking and unlocking movements of knee joint.	157	407	D05(RS2), D14(RS3)
12. Deltoid ligament of ankle joint.	160	412	J07(RS2), J09(RS2), J07
13. Movements and applied anatomy of ankle joint.	161	413	J08
14. Tibiofibular joints.	162	410	D18(RS3)
15. Spring ligament.	164	418	J01
16. Inversion and eversion of foot—joints involved and muscles acting.	166	416	D06(RS2), J16(RS3), D05, D09, D14
Short Answers			
1. Iliofemoral ligament.	148	394	D07(RS2), D14
2. Muscles performing lateral rotation of thigh (lateral rotator muscles of the hip joint).	150	396	D10(RS2)
3. Abductors of hip joint.	150	396	J06

Contd...

Contd...

BDC Vol: 2 IBSANT1

4. Name the ligaments of the knee joint.	152	401	D13
5. Capsule of knee joint.	152	400	J13(RS3)
6. Ligamentum patellae (patellar ligament).	154	402	D11(RS3), J16(RS3), D13
7. Tibial collateral (medial) ligament of knee joint.	154	401	J08(RS2), J05
8. Enumerate intra-articular structures in knee joint.	155	401	J10
9. Cruciate ligaments.	155	402	D17(RS3)
10. Medial meniscus.	155	403	D16(RS3)
11. Functions of menisci of knee joint.	155	403	D09
12. Bursa around knee joint.	156	404	D12(RS3)
13. Mention the genicular nerves supplying the knee joint.	156	406	J13
14. Muscles causing medial rotations of knee joint.	157	406	J07
15. Locking and unlocking of knee joint.	157	407	J17(RS3)
16. What is meant by locking of knee joint?	157	407	D11
17. Deltoid ligament—attachments.	160	412	J98, J10
18. Name subtaloid joints and mention movements possible in it.	163	414	J98
19. Spring ligament—attachments.	164	418	D16(RS3), J99
20. Define eversion of foot. Muscles responsible for eversion of foot (evertors of foot) and their nerve supply.	166	416	D16(RS3), D99
CHAPTER 43: ARCHES OF FOOT			
Long Essay			
1. Name and describe arches of foot (lateral longitudinal/medial longitudinal) under the following heads: (a) Types and bones taking part, (b) Factors maintaining the arches and, (c) Applied aspect.	171	419	D07(RS2), D08(RS2), J15(RS3), D15(RS3), D16(RS3), D18(RS3), D98, D00
Short Essay			
1. Longitudinal arches of foot (medial longitudinal arch of foot).	171	419	D10(RS2), J16(RS3), J99, J03, J09, D13

Contd...

Contd...

BDC Vol: 2 IBSANT1

Short Answers

1. Medial longitudinal arch of foot.	171	419	J11(RS2)
2. Bones forming medial longitudinal arch of foot.	171	419	D06(RS2), J07(RS2), D15
3. Bones forming lateral longitudinal arch of foot.	172	419	D09(RS2), D08

CHAPTER 44: MISCELLANEOUS

None

BDC Vol: 2 IBSANT2

Section 5: ABDOMEN AND PELVIS**CHAPTER 45: INTRODUCTION TO ABDOMEN AND OSTEOLOGY****Short Answers**

1. Structure related to pelvic surface of sacrum.	—	154	D05(RS2)
2. Sacral hiatus.	209	153	D13(RS3)
3. Sacral canal (contents).	209	153	J14(RS3), D00
4. Differences between male and female bony pelvis.	212	—	J16(RS3)

CHAPTER 46: ANTERIOR ABDOMINAL WALL**Long Essays**

1. Describe rectus sheath under following headings: (a) Formation at different levels, (b) Contents, (c) Applied anatomy.	229	168	D12(RS3), J16(RS3), D02, D13
2. Describe inguinal canal under following headings: (a) Location and extent, (b) Openings, (c) Boundaries, (d) Contents (structures passing through), (e) Natural safety mechanisms (factors preventing inguinal hernias), (f) Applied anatomy. Add a note on inguinal hernias.	232	165	D05(RS2), J10(RS2), J13(RS3), D17(RS3), J02, D03, J09, J15, D15

Short Essays

1. Transpyloric plane.	217	159	D13(RS3)
2. Umbilicus.	218	160	J16(RS3), J00
3. Anterior abdominal wall—blood supply and nerve supply.	221	160	J03
4. External oblique muscle.	222	162	J01
5. Rectus abdominis.	224	167	D01

Contd...

Contd...

BDC Vol: 2 IBSANT2

6. Inguinal ligament—attachment and expansions.	225	164	J11(RS2)
7. Conjoint tendon.	226	165	D00
8. Rectus sheath—formation, contents and applied anatomy.	229	168	D10(RS2), D14(RS3), J04, D09, D10
9. Inguinal canal—boundaries and contents. Defensive mechanism.	232	165	J17(RS3), J11
10. Spermatic cord—coverings, contents.	233	166	J10(RS2), J00, D01, J04, J09
11. Protective mechanism of inguinal canal.	233	166	D12(RS3)
12. Inguinal hernia—types, coverings.	235	175	D07
13. Indirect inguinal hernia.	235	175	D10

Short Answers

1. Physiological umbilical hernia.	—	174	J04
2. Transpyloric plane and structures lie on it.	217	159	J07(RS2), J16(RS3), D16(RS3), J18(RS3), J98
3. Raspberry tumor.	219	—	J05
4. Ilioinguinal nerve.	220	170	J16(RS3), J09
5. Inguinal ligament.	225	164	J05
6. Cremasteric reflex.	227	—	J10
7. Conjoint tendon.	226	165	J15(RS3)
8. Cremaster.	226	167	J16(RS3)
9. Pyramidalis muscle—attachments.	227	167	D13(RS3), J14(RS3), D15(RS3), J15
10. Rectus sheath—muscles forming, contents.	229	168	D18(RS3), J05, J10
11. Mention the layers present in the anterior wall of the rectus sheath at different levels.	230	168	D12
12. Inguinal rings (superficial/deep).	232	164	D07(RS2), D08, D10, D14
13. Mention the contents of the inguinal canal.	233	166	D14(RS3), D11
14. Spermatic cord—coverings, contents.	233	166	D07(RS2), J15(RS3), J17(RS3), D99, D07, J08

Contd...

Contd...

BDC Vol: 2 IBSANT2

15. Name the coverings of the spermatic cord, and what are they derived from?	233	167	J14
16. Name the structures protecting the superficial and deep inguinal ring.	234	166	D12
17. Hesselbach's triangle.	—	175	D12(RS3)
18. Sites of hernia in the abdomen.	235	174	D99
19. What is indirect inguinal hernia?	235	175	J13
20. List the differences between direct and indirect inguinal hernia.	237	175	D13

CHAPTER 47: MALE EXTERNAL GENITAL ORGANS

Long Essays

1. Describe testis under following headings: (a) Location and gross features, (b) Blood supply, (c) Lymphatic drainage, (d) Development.	244	181	J06
2. Describe the coverings, microstructure (diagrammatic) and development of testis.	245, 248	182	D14(RS3)

Short Essays

1. Thermoregulation of testis.	—	—	D16(RS3)
2. Ectopic testis.	247	183	J10(RS2)
3. Descent of testis.	249	183	J18(RS3), D02, D05, J08, D12

Short Answers

1. Contents in the body of the penis.	241	179	D13
2. Name the layers present in the scrotum.	243	178	D15
3. Coverings (tunicae) of testis.	245	182	D06(RS2), D07
4. Testis—labeled diagram.	245	181	J07
5. What is tunica vaginalis? And what is the congenital anomaly associated with it?	245	182	D16
6. Venous drainage of testis (testicular vein).	246	183	J08(RS2)
7. Pampiniform plexus of veins.	246	183	D15(RS3)
8. Lymphatic drainage of testis.	246	183	D14
9. Mention the congenital anomalies associated with descent of the testis.	247	183	J13
10. What are the anatomical reasons for the left testicular varicosity?	247	183	D13

Contd...

Contd...

BDC Vol: 2 IBSANT2

11. Descent of testis (factors involved).	249	183	D08(RS2), D12(RS3), D99, D09
12. Gubernaculum testis.	249	183	D01, J03

CHAPTER 48: ABDOMINAL CAVITY AND PERITONEUM

Short Essays

1. Greater omentum—attachments, contents and functions.	257	201	D12(RS3), J14(RS3), J03, D07
2. Lesser omentum—attachments, contents.	258	200	D11(RS3), D16(RS3), D18(RS3), D01, J04, D05, J07, D08
3. Mesentery of small intestine—attachments and contents.	259	205	J07(RS2), D14(RS3), J16(RS3), D18(RS3), J99, J02, D04, J09, D09, J13
4. Describe the vertical disposition of the peritoneum.	261	197	D13
5. Epiploic foramen.	263	200	D06(RS2), D10(RS2), J13(RS3), J00, J02, D03, D04
6. Lesser sac (omental bursa)—location, boundaries, openings, applied anatomy.	264	201	J05(RS2), D07(RS2), J11(RS2), D17(RS3), D98, J01, J05, J07, J08, J09, D16
7. Hepatorenal pouch.	267	208	D06(RS2), D08(RS2)
8. Rectouterine pouch (pouch of Douglas).	267	208	D13(RS3), J17(RS3), J10
9. Peritoneal recesses.	268	204	D10

Short Answers

1. Ileocecal folds.	—	205	J09(RS2)
2. Ovarian bursa.	—	—	J09(RS2)
3. Lesser omentum—contents.	258	200	J06, J10

Contd...

Contd...	BDC Vol: 2 IBSANT2		
4. Mesentery—attachments, borders and contents.	259	205	J17(RS3), J01
5. Root of mesentery.	259	205	J12
6. List the structures crossed by the root of the mesentery.	259	205	D12, D13
7. Structures attached to the root of the transverse mesocolon.	260	205	J14
8. Name the contents of the transverse mesocolon.	260	205	D11
9. Sigmoid mesocolon.	260	206	D14
10. Name the peritoneal ligaments/folds attached to the liver.	260	198	D13
11. Name the umbilical fold and mention their contents.	263	199	J14
12. Epiploic foramen (draw and label/boundaries).	263	200	D05(RS2), J06(RS2), D07(RS2), J10(RS2), J18(RS3), J98, J08, J12, D12, J15
13. Omental bursa.	264	201	J08(RS2)
14. Morrison's hepatorenal pouch.	267	208	D18(RS3)
15. Rectouterine pouch (Douglas pouch)—parts, clinical importance.	267	208	J05(RS2), J12(RS3), J15
16. Name the paraduodenal recesses and mention its applied importance.	268	204	J13
17. Peritoneal recesses in relation to cecum and appendix.	269	205	J99

■ CHAPTER 49: ABDOMINAL PART OF ESOPHAGUS AND STOMACH

Long Essay

1. Describe stomach under following headings: (a) Position, (b) Parts, (c) Gross features, (d) Peritoneal and visceral relations, (e) Blood supply and venous drainage, (f) Nerve supply, (g) Lymphatic drainage, (h) Development and congenital anomalies, (i) Microscopic structure, (j) Applied anatomy.	274	211	J07(RS2), J14(RS3), J99, D00, J05, D06, D08, D09, D11, J13, D13, D14
---	-----	-----	--

Short Essays

1. Describe the parts and lymphatic drainage of the stomach.	274	211	D16
--	-----	-----	-----

Contd...

Contd...	BDC Vol: 2 IBSANT2		
2. Stomach bed.	276	213	J06(RS2), J15(RS3), J16(RS3), D02
3. Blood supply and lymphatic drainage of stomach.	277	213	J12(RS3)
4. Stomach—blood supply.	277	213	J08(RS2), D10(RS2), D14(RS3)
5. Stomach—lymphatic drainage.	277	215	D08(RS2), D09(RS2), D03

Short Answers

1. Name the types of stomach.	—	—	D12
2. Fundus of stomach.	275	213	J15
3. Name the peritoneal folds attached to the stomach.	276	212	D15
4. Structures in stomach bed.	276	213	D99, J08, J10, D10
5. Blood supply of stomach.	277	213	D16(RS3), D18(RS3)
6. Lymphatic drainage of stomach.	277	215	J11(RS2)

■ CHAPTER 50: SMALL AND LARGE INTESTINES

Long Essays

1. Describe the Duodenum under the following headings: (a) Position and parts, (b) Peritoneal and visceral relations, (c) Blood supply, (d) Development.	285	216	D16
2. Describe second part of duodenum under following headings: (a) Relations, (b) Internal features, (c) Arterial supply, (d) Development, (e) Applied anatomy	286	216	D99

Short Essays

1. Describe the parts, peritoneal attachments and blood supply of the duodenum.	285	216	D13, D15
2. Second part of the duodenum—extent, relations, blood supply and development.	286	216	J06(RS2), J12(RS3), J15(RS3), J18(RS3), J04, D06
3. Meckel's diverticulum.	290	220	D05(RS2), J13(RS3)
4. Blood supply of colon (large intestine).	292	225	J13(RS3), J00

Contd...

Contd...

BDC Vol: 2 IBSANT2

5. Cecum (parts, position and blood supply).	294	222	D06(RS2), D11(RS3), J13(RS3), J12, J13
6. Vermiform appendix—situation, positions, peritoneal relations, blood supply, microscopic structure and applied anatomy.	295	223	J06(RS2), D10(RS2), D12(RS3), J98, D99, J08, D08, J11, J14
Short Answers			
1. Interior of second part of duodenum.	287	217	J12
2. Suspensory ligament of duodenum/ligament of Treitz.	288	217	J14(RS3), D14(RS3), D00, J01, D04, J15
3. What is suspensory ligament of the duodenum and what does it represent embryologically?	288	217	J14
4. Blood supply of second part of duodenum.	288	217	J09
5. Duodenal cap.	289	229	D00
6. Meckel's diverticulum.	290	220	D12(RS3), D16(RS3), D01, D03, D10
7. Parts of large intestine.	291	221	J06(RS2)
8. Taenia coli.	292	222	J00, D00
9. Appendices epiploicae.	292	222	J09
10. Difference between large intestine and small intestine.	293	222	D12(RS3), D16
11. Types of cecum.	—	223	J10
12. Name the features in the interior of the cecum.	294	223	D16
13. Ileocecal valve.	295	223	D18(RS3)
14. Vermiform appendix—positions (normal and abnormal).	295	223	J07(RS2), J15(RS3), D17(RS3), D00, D04, D11, D15
15. McBurney's point and its applied importance.	298	224	J08(RS2), J15(RS3), J01, D02, D04, J09, D09

Contd...

Contd...

BDC Vol: 2 IBSANT2

16. Sigmoid colon.	299	227	D12(RS3)
--------------------	-----	-----	----------

CHAPTER 51: LARGE BLOOD VESSELS OF THE GUT

Long Essay

1. Describe portal vein under following headings: (a) Formation, (b) Termination, (c) Course and tributaries, (d) Portocaval anastomosis with systemic veins, (e) Development, (f) Applied anatomy.	309	255	J15(RS3), D98, D01
---	-----	-----	-----------------------

Short Essays

1. Celiac trunk (relations, branches and viscera supplied).	302	250	J08(RS2), D12(RS3), D98, J99, J03, J08, J12, D12
2. Superior mesenteric artery—origin, course and branches.	304	252	J05(RS2), J14(RS3), D03
3. Inferior mesenteric artery.	307	254	D13(RS3), D02, J05, D11
4. Portal vein—formation, course, relations, tributaries and termination.	309	255	J09(RS2), D09(RS2), J12(RS3), J14
Portocaval anastomoses—sites and applied anatomy.	310	257	J07(RS2), D07(RS2), J11(RS2), J14(RS3), D17(RS3), J18(RS3), J00, D02, J08, J15

Short Answers

1. Celiac trunk—branches.	302	250	D08(RS2), D10, D16
2. Superior mesenteric artery—branches.	305	253	J13, D15
3. Splenic artery.	304	252	J16(RS3)
4. Arteries supplying transverse colon.	305	254	J05
5. Inferior mesenteric artery—branches.	307	254	D09(RS2)
6. Name the structures supplied by the inferior mesenteric artery.	307	254	D12
7. Marginal artery of Drummond.	308	254	J10
8. How is the marginal artery of the colon formed?	308	254	J14

Contd...

Contd...

BDC Vol: 2 IBSANT2

9. Sites of portosystemic anastomoses.	310	257	J06(RS2), J99, D11
10. What is the clinical significance of portocaval anastomosis?	310	257	D15
11. Caput medusae.	310	257	D00

CHAPTER 52: EXTRAHEPATIC BILIARY APPARATUS

Long Essay

1. Describe the extrahepatic biliary apparatus.	315	240	J12(RS3)
---	-----	-----	----------

Short Essays

1. Gallbladder.	316	241	J98, D98, D99, D01, D11
2. Bile duct (formation, termination and relations).	317	242	J11(RS2), D11(RS3), J00, J01, J03, D05

Short Answers

1. Structures forming extrahepatic biliary apparatus.	315	241	J06
2. What are the parts of the gallbladder?	316	241	J13, D15
3. Location of fundus of gallbladder.	316	241	J07
4. Ampula of Vater.	317	243	J11
5. Sphincters related to bile and pancreatic duct.	318	242	J08

CHAPTER 53: SPLEEN, PANCREAS AND LIVER

Long Essays

1. Describe spleen under following headings: (a) Situation, size and shape, (b) Borders and surfaces, (c) Peritoneal and visceral relations, (d) Ligaments, (e) Blood supply, (f) Development, (g) Microscopic structure, (h) Functions, (i) Applied anatomy.	322	247	D07, J08
2. Describe pancreas under following headings: (a) Position, (b) Gross features (parts), (c) Peritoneal and visceral relations, (d) Ducts, (e) Blood supply, (f) Lymphatic drainage, (g) Development, (h) Microscopic anatomy, (i) Applied anatomy.	327	244	D06(RS2), J11(RS2), D15(RS3), J04, J11, D12

Contd...

BDC Vol: 2 IBSANT2

3. Describe gross anatomy of head of pancreas under the following headings: (a) Situation and gross features, (b) Relations, (c) Blood supply, (d) Development.	327	244	D10(RS2), J98
4. Describe the gross anatomy of liver with its applied aspects.	332	231	D14(RS3)

Short Essays

1. Spleen—situation, surfaces (visceral), relations, blood supply.	322	247	D09(RS2), J02, D04, D05, D06, J09
2. Ligaments of spleen—attachments, contents and development.	323	247	J06(RS2), J09(RS2), J04
3. Ligaments and relations of spleen.	323	247	J15(RS3), J06
4. Hilum of the spleen—contents.	324	247	J10(RS2), J12
5. Head of pancreas.	327	244	D10
6. Relations of pancreas.	327	245	D14
7. Blood supply and development of pancreas.	329	246	J06, J09
8. Porta hepatis—location, contents and applied anatomy.	333	235	D06
9. Inferior surface of liver.	335	235	

Short Answers

1. Ligaments (peritoneal) of spleen—attachments, contents.	323	247	D06(RS2), D10(RS2), D16(RS3), J98, D99, J12, D16
2. Visceral surface of spleen (relations, impressions).	324	247	J01, J07, D08, D15
3. Splenic circulation.	324	248	J13(RS3)
4. Name the parts and secretions of the pancreas.	327	244	D13
5. Uncinate process of pancreas.	328	244	J15
6. Porta hepatis.	333	235	J06(RS2), D05
7. Ligaments (supports) of liver.	261, 333	236	D10
8. Name the lobes of liver.	333	235	J15
9. Anatomical and physiological lobes of liver.	333, 336	235	D99
10. Bare areas of liver.	334	234	J07(RS2), J08(RS2), D18(RS3), J99, J01, D04, J07, J08, D14

Contd...

BDC Vol: 2 IBSANT2

11. Boundaries of bare area of liver.	334	234	D11
12. What are the embryological remnants associated with the liver?	334	238	D16
13. Segments of liver.	336	236	J13(RS3)

CHAPTER 54: KIDNEY AND URETER

Long Essays

1. Describe kidneys (right and left) under following headings: (a) Location, size, borders and surfaces (general features), (b) Coverings. (c) Relations (visceral and peritoneal), (d) Blood supply, (e) Development and congenital anomalies, (f) Applied anatomy.	341	259	D07(RS2), D05, J07, J10, J12, J14
2. Describe the coverings, microstructure (diagram only) and development of kidney.	343, 305	260, 266, D13(RS3)	(HIST), 267 (EMB)

Short Essays

1. Relations of right kidney.	342, 343	261	J07(RS2), J03, D14
2. Relations of left kidney.	342, 343	261	J15
3. Anterior relations of (right/left) kidney.	343	262	J08(RS2)
4. Coverings of kidney.	343	260	J98, D03
5. Renal fascia.	343	260	J01
6. Vascular segments of kidney.	345	264	D08
7. Ureter—formation, course, relations and constrictions.	348	267	J14(RS3), J15(RS3), J18(RS3), D12
8. Left ureter (in females).	348	267	J02
9. Right ureter (in females).	348	267	D00, D04, D09

Short Answers

1. Posterior relations of kidney.	342	261	J05
2. Posterior relations of left kidney.	342	261	D15(RS3), D13
3. Muscles related to posterior surface of right kidney.	342	261	D99
4. Labeled diagram of anterior surface of right kidney.	342	262	D00
5. Relations of anterior surface of right kidney.	343	262	D10(RS2)
6. Anterior relations of left kidney.	343	262	D09

Contd...

Contd...

BDC Vol: 2 IBSANT2

7. Coverings of kidney.	343	260	J07, D10, J13
8. Segments of kidney.	345	264	J15(RS3)
9. Constrictions of ureter—bony landmarks.	349	267	J11, D11, J12, D13
10. Pelvic part of ureter.	351	267	J12(RS3)

CHAPTER 55: SUPRARENAL GLAND AND CHROMAFFIN SYSTEM

Long Essay

1. Describe suprarenal glands under following headings: (a) Location and gross features, (b) Relations, (c) Blood supply, (d) Development.	356	268	J01, D04
--	-----	-----	----------

Short Essay

1. Suprarenal glands (right/left)—position, coverings, relations, blood supply, development, applied anatomy.	356	268	D05(RS2), J11(RS2), D18(RS3), D98, J05, J06, J07, D08, D15
---	-----	-----	--

Short Answers

1. Layers of suprarenal cortex and hormones secreted by each layer.	358	268	D09(RS2)
2. Blood supply of suprarenal gland (arterial supply and venous drainage).	358	269	J06(RS2), J09(RS2), J09, J12, J13

CHAPTER 56: DIAPHRAGM

Long Essay

1. Describe the thoracoabdominal diaphragm under following headings: (a) Attachments, (b) Openings and structures passing through, (c) Actions and nerve supply, (d) Applied anatomy, (e) Congenital anomalies.	361	35	J16(RS3), J18(RS3), J13
---	-----	----	-------------------------

Short Essays

1. Describe the attachments and major openings of the diaphragm.	361	35	D13
2. Attachments of respiratory diaphragm.	361	35	J11
3. Major openings in the thoracic diaphragm.	363	36	J06(RS2), D11(RS3), J99

Short Answers

1. Origin of diaphragm.	361	35	D07(RS2)
-------------------------	-----	----	----------

Contd...

Contd...

BDC Vol: 2 IBSANT2

2. Central tendon of diaphragm.	363	35	D01
3. Openings (major and minor) of diaphragm and structures passing through them.	363	36	J08(RS2), J09(RS2), D16(RS3), J03, J04, J05, D07
4. Name the structure entering the abdomen under the median, medial and lateral arcuate ligaments.	363	36	J14
5. Structures passing through aortic opening in diaphragm at level of 12th thoracic vertebra.	363	36	D06(RS2), J08, J12
6. Mention the structures passing through the vena caval hiatus of the diaphragm.	363	36	D10
7. Name the structures passing through esophageal opening in diaphragm.	363	36	D11
8. Nerve supply of diaphragm.	363	38	J05(RS2), D10(RS2), J98, D03
9. Root value and distribution of phrenic nerve.	363 (175-Vol-3)	38	D02
10. Diaphragmatic hernias.	364	38	J12

CHAPTER 57: POSTERIOR ABDOMINAL WALL

Short Essays

1. Abdominal aorta—labeled diagram, branches.	367	275	J06, J10
2. Renal artery and its development.	368	277	D10
3. Inferior vena cava—formation, tributaries and termination.	369	279	J16(RS3), D15
4. Left renal vein.	370	280	D00
5. Iliopsoas.	371	274	J10(RS2)
6. Quadratus lumborum.	372	274	J99, D07
7. Thoracolumbar fascia.	373	272	J18(RS3), J03, J12
8. Lumbar plexus—formation and branches.	373	323 (IBSANT1)	D12(RS3), D06, J11
9. Lumbosacral trunk.	374	294	D14
Short Answers			
1. Name the branches of abdominal aorta and their level of origin.	368	276	J15(RS3), D14
2. Left renal vein.	370	280	D05(RS2)

Contd...

Contd...

BDC Vol: 2 IBSANT2

3. Tributaries of left renal vein.	370	280	D11
4. Cisterna chyli.	371	285	D14
5. Mention the attachment of thoracolumbar fascia.	373	272	D00
6. Lumbosacral trunk.	374	294	J13(RS3)
7. Celiac plexus.	375	283	J01, D04, J05

CHAPTER 58: PERINEUM

Long Essay

1. Describe ischioanal (ischioanal) fossa under following headings: (a) Boundaries and recesses, (b) Contents, (c) Applied anatomy.	383	190	D06(RS2), D13(RS3), J00, D08
---	-----	-----	------------------------------

Short Essays

1. Perineal body.	382	191	D16(RS3), D98, J02, D04
2. Ischioanal (ischioanal) fossa—boundaries, contents and applied anatomy.	383	190	J12(RS3), D05(RS2), J09(RS2), J11(RS2), D15(RS3), D16(RS3), D18(RS3), J98, D98, J02, D04, D05, D12, D14, J15
3. Deep perineal pouch—boundaries and contents.	387	188	D99, J01, J09, D09, D12
4. Perineal membrane—attachments, structures piercing.	388	188	D09(RS2), D12(RS3), D17(RS3), D07, D10
5. Urogenital diaphragm.	388	189	J10, J15
6. Describe the attachments and structures piercing the female perineal membrane.	388	188	J14
7. Superficial perineal pouch—boundaries and contents.	389	186	J05(RS2), D10(RS2), J17(RS3), D02, D03, J12, J13
8. Pudendal canal.	394	190	D05(RS2), J14(RS3), J15(RS3), D02, J07, J09, J10

Contd...

Contd...	BDC Vol: 2 IBSANT2		
9. Pudendal nerve.	395	192	J06(RS2), D01, D03
Short Answers			
1. Perineal body (muscles attached).	382	191	D05(RS2), J10(RS2), D15(RS3), J08, D14
2. Ischioanal (ischioanal) fossa—walls and contents and subdivisions.	383	190	D09, D16
3. Perineal membrane (attachments).	388	188	J12(RS3), D15
4. Why does extravasated urine not enter the thigh under the collis fascia?	389	162	D13
5. Urogenital diaphragm—muscles forming and structures piercing.	388	189	J07(RS2), D14(RS3)
6. Contents of superficial perineal pouch.	389	187	J09(RS2), D17(RS3), J08
7. Pudendal canal—boundaries and contents.	394	190	D15
8. Pudendal nerve (course).	395	192	D11(RS3), D12
9. Branches of internal pudendal nerve.	395	193	J07(RS2), D09
10. Pudendal nerve block.	395	193	J05(RS2)
CHAPTER 59: PRELIMINARY CONSIDERATIONS OF BOUNDARIES AND CONTENTS OF PELVIS			
None			
CHAPTER 60: URINARY BLADDER AND URETHRA			
Long Essay			
1. Describe urinary bladder under following headings: (a) Position, (b) Capacity, (c) Parts, (d) Surfaces and borders, (e) Peritoneal and visceral relations, (f) Ligaments and supports, (g) Blood supply, (h) Nerve supply, (i) Development, (j) Applied anatomy.	404	306	J08(RS2), D09(RS2), D18(RS3), J98, D15
Short Essays			
1. Urinary bladder—surfaces, labeled diagram, supports, blood supply, nerve supply, lymphatic drainage, development.	404	306	J07(RS2), J11(RS2), D03, J07, D07, J11
2. Describe the parts, peritoneal relations and interior of the urinary bladder.	406	306	D13

Contd...

Contd...	BDC Vol: 2 IBSANT2		
3. Trigone of bladder—boundaries, structure, applied anatomy.	406	309	D15(RS3), J00, J02, J04, D04, D08, J12
4. Nerve supply and development of urinary bladder.	407	310	D10(RS2)
5. Male urethra (parts with their developments).	408	311	D12(RS3), D01, J08
6. Prostatic part of urethra—length, course, features, structures opening.	409	312	J98, D98, J01, D07
Short Answers			
1. Supports of urinary bladder.	406	308	D08(RS2)
2. Trigone of urinary bladder.	406	309	D13(RS3), D17(RS3), J15, D16
3. Nerve supply of urinary bladder.	407	310	J15(RS3), D11
4. Male urethra—parts.	408	311	D18(RS3)
5. Prostatic urethra.	409	312	D15(RS3), J17(RS3), J18(RS3), D14
CHAPTER 61: FEMALE REPRODUCTIVE ORGANS			
Long Essay			
1. Describe uterus under following headings: (a) Position (normal axis) and parts, (b) Gross anatomy, (c) Peritoneal reflections, (d) Relations, (e) Supports, (f) Blood supply, (g) Development, (h) Applied anatomy.	419	325	J05(RS2), J06(RS2), J11(RS2), J99, D99, J03, D05, J13, D14
Short Essays			
1. Ovarian fossa.	414	322	J00
2. Ovary—position, parts, surfaces, relations, ligaments, blood supply.	414	321	J01, D06, J07, J12, D16
3. Ovary—relations and histology.	414	322	D12(RS3)
4. Fallopian/uterine tube (parts and development).	417	323	D13(RS3), D18(RS3), J99, D01, D03, D05, J06, D10
5. Name the parts of the uterus and explain the supports of the uterus.	420	325	J14
6. Ligaments of uterus.	421	326	J05
7. Broad ligament of uterus—attachments and contents.	422	327	J04, D09

Contd...

Contd...

BDC Vol: 2 IBSANT2

8. Uterus—blood supply and lymphatic drainage.	422	328	D08
9. Supports of uterus and their applied importance.	423	327	J08(RS2), D17(RS3), J18(RS3), D00, J02, D04, D07, D10, D15
Short Answers			
1. Ovarian fossa (relations).	414	322	J10, J14, J15
2. Mesovarium.	415	321	J11
3. Fallopian (uterine) tube—parts and blood supply.	417	324	J06(RS2), D99, D09, D16
4. Enumerate the parts of uterus and fallopian tube.	420, 417	325, 324	D12(RS3)
5. Tubectomy.	419	325	D11(RS3), J08
6. Positions and parts of uterus.	419	325	D06(RS2)
7. Normal position of uterus.	419	326	J11
8. Uterine axis.	419	326	J14(RS3)
9. Name the ligaments attached to the cervix of the uterus.	421	327	D16
10. Broad ligament of uterus—contents.	422	327	J05(RS2), D16(RS3), D12
11. Course and branches of uterine artery.	422	292	J14(RS3)
12. Four supports of uterus.	423	328	J15
13. Uterosacral ligament.	425	328	J13(RS3)
14. Vagina.	426	329	J13(RS3)

CHAPTER 62: MALE REPRODUCTIVE ORGANS**Long Essay**

1. Describe prostate gland under following headings: (a) Coverings (capsule), (b) Parts (lobes), (c) Relations, (d) Blood supply, (e) Age changes, (f) Applied anatomy (surgical importance).

Short Essays

1. Prostate—location (position), capsule (coverings), lobes (parts), blood supply, age changes and applied anatomy.

Contd...

Contd...

BDC Vol: 2 IBSANT2

2. Lobes of prostate gland.	436	317	D14(RS3), D15(RS3)
-----------------------------	-----	-----	-----------------------

Short Answers

1. Vas deferens. 433 314 J09(RS2)
2. Vasectomy. 435 316 D00

CHAPTER 63: RECTUM AND ANAL CANAL**Long Essays**

1. Describe rectum and anal canal under the following headings: (a) Gross anatomy, (b) Supports, (c) Blood supply. 442, 448 296, 300 D10
2. Describe interior of rectum and anal canal. Add a note on its: (a) Development, (b) Applied anatomy. 444, 448 298, 300 D08(RS2)
3. Describe anal canal under following headings: (a) Extent, (b) Development/embryological origin, (c) Gross anatomy (d) Internal features, (e) Sphincters, (f) Blood supply, (g) Lymphatic drainage, (h) Nerve supply, (i) Applied anatomy. 448 300 J16(RS3),
J17(RS3),
J18(RS3), D02,
J11

Short Essays

1. Rectum—extent, relations. 442 296 J07
2. Blood supply and development of rectum and anal canal. 445, 450 298, 302 J01
3. Anal canal—location, interior, blood supply, lymphatic drainage and development. 448 300 J07(RS2),
D09(RS2), D98,
J99, J06, D06,
D09, D11
4. Describe the interior of the anal canal and add a note on its applied anatomy. 448 300 J13, D13

Short Answers

1. Valves present in the rectum/What are Houston's valves and what is its function? 444 298 D12, D16
2. Pectinate line/Hilton's line—importance. 449 301 D12(RS3),
J13(RS3)
3. Anal sphincters. 449 302 D13(RS3)
4. Sphincter ani externus muscle. 449 302 D07
5. Name the causes and types of hemorrhoids in the anal canal. 451 303 D12, J14

Contd...

Contd...

BDC Vol: 2 IBSANT2

CHAPTER 64: WALLS OF PELVIS

Short Essays

1. Internal iliac artery—course and branches of distribution.	454	291	J15(RS3), D00
2. Describe the branches of the anterior trunk of the internal iliac artery.	454	291	D13
3. Nervi erigentis.	458	—	J03
4. Levator ani muscle.	460	288	J12(RS3), J03
5. Pelvic diaphragm—components, attachment of muscles, openings, functions.	461	288	J13(RS3), J14(RS3), J04, D06
6. Sacrotuberous ligament.	463	155	D11

Short Answers

1. Branches of external iliac artery.	—	279	J06
2. Branches of Internal iliac artery.	454	291	J05(RS2), D13(RS3), D08
3. Name the branches of the anterior division of the internal iliac artery.	454	291	D12
4. Name the branches of posterior trunk of internal iliac artery.	455	293	D14
5. Nervi erigentis.	458	—	J06
6. What are the different components of the levator ani muscle?	460	288	D16
7. What are the different components of the pelvic diaphragm?	461	288	D12
8. Name the muscles forming the pelvic diaphragm.	461	288	D11
9. Sacrotuberous ligament—attachments and morphology.	463	155	D05(RS2)

BDC
Vol: 3

IBSANT3

Section 6: HEAD AND NECK

CHAPTER 65: OSTEOLOGY OF HEAD AND NECK

Short Essays

1. Superior orbital fissure.	23	32	J05
2. Hyoid bone.	48	30	J07(RS2), J00, J03

Contd...

Contd...

BDC Vol: 3 IBSANT3

Short Answers

1. Name paired bones of cranium.	4	20	J10
2. Anterior fontanel and its clinical importance.	5	34	J08
3. Bregma—labeled diagram.	5	11	J06
4. Nasion.	9	13	D17(RS3)
5. Asterion—bones meeting and venous sinus related deep to it.	12	36	D02
6. Pterion—bone meeting and its clinical importance.	12	36	D14(RS3), J00, J01, D04, J07
7. Attachments of mastoid process.	13	26	D03
8. Hard palate—bones forming.	13	148	J12(RS3), J18(RS3), J05
9. Foramen spinosum.	16	17	D16
10. Superior orbital fissure—boundaries and structures passing through (contents).	23, 26	32	J06(RS2), D06, J09
11. Mention two features of the fetal skull.	28	36	D10
12. Name foramina in middle cranial fossa.	56	16	D06(RS2)
13. Foramen ovale—structures passing through.	56	17	D11(RS3), J16(RS3), J05, J07, J08, J12
14. Foramen magnum—structures passing through.	56	17	J11(RS2), J18(RS3), D99, J04
15. Jugular foramen—structure passing through.	56	17	J02, D09

CHAPTER 66: SCALP, TEMPLE AND FACE

Long Essays

1. Define and name layers of the scalp. Give its blood supply, nerve supply and applied anatomy.	60	43	J10(RS2), D00
2. Describe blood supply and venous drainage of face and add a note on applied anatomy.	71	63	D05(RS2)

Short Essays

1. Scalp—layers, blood supply and nerve supply/applied anatomy.	60	43	D07(RS2), D14(RS3), J15(RS3), D15(RS3), D16(RS3), D08
---	----	----	---

Contd...

Contd...

BDC Vol: 3 IBSANT3

2. Emissary veins.	62	270	J03
3. Orbicularis oculi—parts, attachments, nerve supply and actions.	66	56	D06(RS2), J13(RS3)
4. Buccinator muscle.	66	56	J15(RS3), J03, D14
5. Cutaneous innervation of face.	70	6	J08(RS2)
6. Lacrimal apparatus.	75	52	J11(RS2), D15(RS3), D16

Short Answers

1. Name the layers of scalp and mention the dangerous layer of scalp.	60	43	D06, D11, D14
2. Retromandibular vein (formation).	62	65	J16(RS3), J99
3. Sensory nerve supply of scalp.	63	45	J11
4. Nerves supplying (sensory and motor innervations) anterior quadrant of scalp.	63	45	J14
5. What is black eye? Give reasons.	63	46	J12(RS3), J00, J09
6. Buccinator muscle.	66	56	D07(RS2)
7. Platysma.	67	127	J09
8. Features of Bell's palsy.	69	303	J05(RS2)
9. Sensory nerve supply of face.	70	6	J13(RS3), D99
10. Facial vein.	72	65	D17(RS3)
11. Dangerous area of the face.	72	65	D16(RS3), J13
12. Constituents of lacrimal apparatus and their function.	75	52	D06, J13
13. Nasolacrimal duct.	76	53	D13(RS3), J16(RS3), J11

CHAPTER 67: SIDE OF NECK**Long Essay**

1. Describe the boundaries, parts and contents of posterior triangle of neck.	88	135	D12(RS3), J07
---	----	-----	---------------

Short Essays

1. General investing layer of deep cervical fascia.	81	121	J18(RS3), J03
2. Carotid sheath.	85	123	D08(RS2), J11(RS2), D17(RS3), D99, J00, D03
3. External jugular vein—formation, relations, tributaries and applied anatomy.	88	263	J10

Contd...

Contd...

BDC Vol: 3 IBSANT3

Short Answers

1. Virchow's node.	—	—	D06
2. Fascia colles.	81	121	J11
3. Contents of suprasternal space of burn.	83	121	J12
4. Pretracheal fascia.	84	122	D10(RS2)
5. Suspensory ligament of Berry.	84	—	J07
6. Contents of carotid sheath.	85	123	J05(RS2), J07(RS2), J11
7. Sternocleidomastoid muscle—origin, insertion, nerve supply and actions.	85	127	D99, J15
8. Torticollis (wry neck).	87	128	J01, D04
9. External jugular vein—formation, termination and tributaries.	88	263	D13(RS3), D14(RS3), J15(RS3), J00, J12, D13, D16

CHAPTER 68: ANTERIOR TRIANGLE OF NECK**Short Essays**

1. Digastric triangle—boundaries and contents.	97	138	J18(RS3), D08
2. Carotid triangle.	99	139	J09
3. Carotid sinus.	100	243	D09
4. Describe the origin, course, branches and termination of the external carotid artery.	101	249	J13
5. Lingual artery.	102	251	D09(RS2)
6. Facial artery—origin, termination, course, relation and branches.	103	251	J09(RS2), J06, D07, J09
7. Ansa cervicalis—formation, labeled diagram, distribution.	104	278	J15(RS3), J16(RS3), D98, D05

Short Answers

1. Digastric triangle (contents).	97	138	J10(RS2), D98, D14
2. Draw a neat labeled diagram of boundaries and subdivisions of anterior triangle of neck.	98	138	J15(RS3)
3. Boundaries and contents of carotid triangle.	99	139	J14(RS3), J14

Contd...

Contd...

BDC Vol: 3 IBSANT3

4. Branches of external carotid artery.	102	250	J06(RS2), J17(RS3), J18(RS3), J98, D08, D11, J15
5. Facial artery (branches).	103	251	J13(RS3), J05
6. Ansa cervicalis (root value, branches and distribution).	104	278	J11(RS2), J15
7. Boundaries of muscular triangles of neck.	104	135	D06

CHAPTER 69: PAROTID REGION

Long Essay

1. Describe parotid salivary gland under following headings: (a) Position, (b) Surfaces, borders, relations and duct, (c) Coverings, (d) Parts, (e) Contents, (f) Blood and nerve supply, (g) Applied anatomy.	108	58	D03, D07, J11, D11, J14
--	-----	----	-------------------------

Short Essays

1. Parotid duct—origin, termination, relations and structures pierced by it.	111	61	J06(RS2), J01, D05, J07
2. Parotid gland (nerve supply).	112	58	J09

Short Answers

1. Structures present within substance of parotid gland.	111	59	J09(RS2), J02, D08
2. Parotid duct (Stenson's duct).	111	61	D05(RS2), D08(RS2), D98, D16
3. Structure pierced by parotid duct before its termination.	112	61	D99
4. Trace pathway for secretomotor (parasympathetic) fibers to parotid gland.	112	62	J98, J10, D12

CHAPTER 70: TEMPORAL AND INFRATEMPORAL FOSSA

Long Essays

1. Name muscles of mastication. Describe them under following headings: (a) Origin, (b) Insertion, (c) Nerve supply, (d) Actions. Add a note on its development.	118	76	J08(RS2), J11(RS2), D13(RS3), D18(RS3), D14
2. Describe temporomandibular joint. Add a note on its applied anatomy.	123	78	D01, D10

Contd...

Contd...

BDC Vol: 3 IBSANT3

Short Essays

1. Temporalis—attachments, nerve supply, action.	118	76	J12(RS3), J04
2. Lateral pterygoid muscle.	118	76	D05(RS2), J17(RS3), D00
3. Maxillary artery.	121	253	J02, D04
4. Articular disk of temporomandibular joint.	124	78	J00
5. Movements of temporomandibular joint and muscles causing them.	126	80	D10(RS2), D15(RS3)
6. Lingual nerve—origin, course and distribution.	129	94	D12
7. Otic ganglion and its connections.	131	75	J05(RS2), D17(RS3), J99, J03, J11

Short Answers

1. Muscles of mastication and their nerve supply.	118	76	J15
2. Lateral pterygoid muscle—nerve supply and actions.	118	76	J10
3. Branches of maxillary artery—1st part/3rd part.	122	254	J05, D07, J14
4. Ligaments of temporomandibular joint.	124	79	D06
5. Movements of protraction and retraction of mandible.	126	80	J07(RS2)
6. Branches of mandibular nerve.	128	74	D01
7. Enumerate the muscles supplied by mandibular nerve.	129	74	J12
8. Auriculotemporal nerves.	129	74	D15(RS3)

CHAPTER 71: SUBMANDIBULAR REGION

Short Essays

1. Hyoglossus muscle.	135	91	J09(RS2), J98, J01, D03, D06, J15, D15
2. Submandibular salivary gland—location, parts, relations and nerve supply.	137	82	J13, D15
3. Submandibular ganglion.	139	95	D12(RS3)

Short Answers

1. Digastric muscle—origin, insertion and nerve supply.	135	86	D10(RS2), J00
---	-----	----	---------------

Contd...

Contd...

BDC Vol: 3 IBSANT3

2. Submandibular duct	138	84	D15(RS3), D12
3. Mention the secretomotor supply of submandibular salivary gland.	139	84	D10, J15
4. Submandibular ganglion.	139	95	D09
5. Secretomotor fibers of submandibular ganglion.	139	95	D14(RS3)

CHAPTER 72: STRUCTURES IN THE NECK

Long Essay

1. Describe thyroid gland under following headings: (a) Position, (b) Parts, (c) Capsule and ligaments, (d) Gross features, (e) Relations, (f) Blood supply and venous drainage, (g) Histology (microscopic anatomy), (h) Development, (i) Applied anatomy.	144	237	D06(RS2), D10(RS2), D11(RS3), J13(RS3), D16(RS3), J17(RS3), J99, D02, J03
---	-----	-----	---

Short Essays

1. Describe the position, parts, relations and coverings of the thyroid gland.	144	237	D18(RS3), D13
2. Thyroid gland—blood supply.	147	239	D11
3. Parathyroid glands.	149	242	J01, J05
4. Internal jugular vein (tributaries).	158	261	D01
5. Submandibular group of lymph nodes.	163	7	D02
6. Styloid apparatus.	165	—	J99, J04, D08

Short Answers

1. Labeled diagram of thyroid gland.	145	237	J05
2. Thyroid gland—blood supply and venous drainage.	147	239	D15(RS3), D08
3. Blood supply to isthmus of thyroid.	147	239	J07(RS2)
4. Internal jugular vein—tributaries.	158	261	J05(RS2), J10(RS2), D09, J15
5. Name the tributaries of the left brachiocephalic vein.	159	113 (IBSANT2)	D10
6. Features of Horner's syndrome.	161	315	J12(RS3), D18(RS3), D01
7. Styloid apparatus.	165	—	J14(RS3)
8. Styloid process of temporal bone.	165	26	D05(RS2), D15(RS3)

Contd...

Contd...

BDC Vol: 3 IBSANT3

CHAPTER 73: PREVERTEBRAL AND PARAVERTEBRAL REGION

Short Essays

1. Trachea.	175	182	D02
2. Atlantoaxial joint.	179	39	D99

Short Answers

1. Cervical pleura.	173	—	D03
2. Type and movements at atlanto-occipital joint.	178	40	J02

CHAPTER 74: BACK OF NECK

Short Essays

1. Suboccipital space (triangle)—boundaries and contents.	186	144	J06(RS2), D11(RS3)
2. Suboccipital nerve.	186	145	J09

Short Answers

1. Suboccipital triangle.	186	144	J08(RS2), D09(RS2)
2. Suboccipital nerve.	186	145	J01, D04

CHAPTER 75: CONTENTS OF VERTEBRAL CANAL

Short Essays

1. Filum terminale.	190	340	J12
2. Cauda equina.	192	117	D02

Short Answers

1. Modifications of pia mater.	190	340	D16
2. Ligamentum denticulatum.	190	116	D10(RS2), J17(RS3)
3. Filum terminale.	190	340	J11(RS2), D11(RS3), J18(RS3), J06, D12
4. Cauda equina.	192	117	D08, D16

CHAPTER 76: CRANIAL CAVITY

Long Essay

1. Classify dural venous sinuses. Describe cavernous sinus under following headings: (a) Relations, (b) Tributaries, (c) Communications, (d) Applied anatomy.	199	265, 267	J05(RS2), J18(RS3), J98, J02, D06, J10, D13, D16
---	-----	----------	--

Contd...

Contd...

BDC Vol: 3 IBSANT3

Short Essays

1. Falx cerebri.	196	101	D08(RS2), D14
2. Cavemous sinus—situation, tributaries and structures within.	199	267	J07(RS2), D08(RS2), J08 D12
3. Pituitary gland—position, parts and secretions.	204	232	

Short Answers

1. Name the cranial dural folds.	196	101	J13
2. Falx cerebri.	196	101	D06(RS2), J11
3. Venous sinuses present in falx cerebri.	197	101	J06
4. Name the dural venous sinuses related to tentorium cerebelli.	197	102	D14
5. Name paired dural venous sinuses.	199	267	D11
6. Name the structures present in the lateral wall of the cavernous sinus.	200	268	J13
7. Cavernous sinus—tributaries of cavernous sinus.	200	268	D05(RS2), J04
8. Superior sagittal sinus.	202	265	D12(RS3)
9. Straight sinus—formation, termination and applied anatomy.	203	266	D11(RS3), J07, D09
10. Sigmoid sinus.	203	267	D09(RS2), D12
11. Blood supply of hypophysis.	205	235	D07(RS2)
12. What is hypothalamohypophysial portal system?	206	235	J14

CHAPTER 77: CONTENTS OF THE ORBIT**Long Essay**

1. Describe extraocular muscles under following headings: (a) Origin, (b) Insertion, (c) Relations, (d) Actions, (e) Nerve supply, (f) Applied anatomy. Discuss the movements of eyeball.	213	186	J15(RS3), D17(RS3), J04, J05, J09, J15
---	-----	-----	--

Short Essays

1. Explain the attachments, action and nerve supply of the recti muscles of the eyeball.	214	186	J14
2. Oblique muscles of eyeball, their origin, insertion, action and nerve supply.	215	186	D16(RS3)

Contd...

Contd...

BDC Vol: 3 IBSANT3

3. Ciliary ganglion—type, location, connections (roots, branches).	220	194	D10(RS2), J13(RS3), D00, D01, J04, D07, D11, D16
--	-----	-----	--

Short Answers

1. Name extraocular muscles and give their nerve supply.	213	186	J02, D13, D15
2. Lateral rectus muscle of eye.	220	186	J11
3. Superior oblique muscle of the eye (nerve supply and action).	215	186	J10(RS2), J99, J10, D12
4. Nerve supply and actions of inferior rectus muscle of eyeball.	215	186	D14
5. Levator palpebrae superioris (nerve supply).	215	186	D15(RS3)
6. Ciliary ganglion (secretomotor fibers).	220	194	J16(RS3)

CHAPTER 78: MOUTH AND PHARYNX**Long Essays**

1. Describe muscles, nerve supply, development and congenital anomalies of soft palate.	231	150	D09
2. Name the muscles of the soft palate. Give (a) Origin, (b) Insertion, (c) Nerve supply of levator veli palatini muscle. Describe the movements of soft palate. Add a note on development of soft palate.	231	150	J09(RS2)
3. Name the different types of tonsils. Describe palatine tonsil under following headings: (a) Position, (b) Blood supply, (c) Relations, (d) Microscopic anatomy, (e) Development, (f) Applied anatomy.	237	171	J12(RS3)
4. Name the muscles of pharynx. Give: (a) Origin, (b) Insertion, (c) Nerve supply, (d) Actions, (e) Relations of superior constrictor muscle of pharynx. Add a note on its surgical anatomy.	241	168	D07(RS2)

Short Essays

1. Soft palate.	231	149	J99
2. Muscles of soft palate, attachments, nerve supply and action.	233	150	D11(RS3), J13

Contd...

Contd...

BDC Vol: 3 IBSANT3

3. Mention the subdivisions of the pharynx and explain the nasopharynx.	237	165	J13
4. Nasopharynx.	236	166	D02
5. Palatine tonsil—relations, blood supply and applied anatomy.	237	172	J10, D12
6. Muscles of pharynx.	241	168	J08(RS2)
7. Constrictors of pharynx.	241	168	J12
8. Inferior constrictor of pharynx	242	168	D08
9. Auditory tube—length, extent, relations and functions.	244	222	J98, J02, D04, D07

Short Answers

1. Name muscles of soft palate with nerve supply.	233	150	J10, D15
2. Structures forming Waldeyer's ring.	237	173	J01, D04, D07
3. Location and content of the tuba & tonsil.	237	167	D13
4. Openings in nasopharynx.	237	166	J05
5. Blood supply and lymphatic drainage of tonsil.	238	172	D09(RS2), J99, D14
6. Killian's dehiscence.	243	171	J09
7. Nerve supply of pharynx.	243	170	J04
8. Give the dimensions and functions of auditory tube.	244	222	J12
9. Location of openings of auditory tube.	244	222	D05

CHAPTER 79: NOSE AND PARANASAL SINUSES**Short Essays**

1. Nasal septum—formation, blood supply and nerve supply.	250	156	D07(RS2), J17(RS3), J08, J10, J12, D14
2. Lateral wall of nasal cavity—features, blood supply and innervations.	251	156	J14(RS3), J05, D10, D13, J14
3. Middle meatus of nose.	253	157	D05(RS2)
4. Maxillary air sinus.	255	160	J05(RS2), J06(RS2), D11
5. Pterygopalatine ganglion.	258	302	J10(RS2)

Short Answers

1. Components of nasal septum.	250	156	J14
2. Blood supply of nasal septum.	250	158	J10(RS2)
3. Little's area.	250	160	D16

Contd...

Contd...

BDC Vol: 3 IBSANT3

4. Middle meatus of nose (osteomeatal complex).	253	157	D18(RS3), D98, D03
5. Structures opening in middle meatus of nose.	253	157	D06(RS2), J08, D09, D16
6. Name the paranasal air sinuses opening into middle meatus of nose.	253	157	D15
7. Frontal sinus.	255	160	D17(RS3)
8. Maxillary sinus.	255	160	D14(RS3)
9. Pterygopalatine fossa—contents.	257	—	D02
10. Pterygopalatine ganglion.	258	302	J09

CHAPTER 80: LARYNX**Long Essays**

1. Describe the cartilages and muscles of larynx.	263	174	D15(RS3)
2. Describe the intrinsic muscles of larynx with applied aspects.	267	179	D14(RS3)
3. Name intrinsic muscles of larynx. Give (a) Origin, (b) Insertion, (c) Nerve supply, (d) Actions of cricothyroid muscle. Add a note on movements of vocal cords.	267	179	D08(RS2)

Short Essays

1. Thyroid cartilage.	263	174	J15(RS3)
2. Interior (Cavity) of larynx.	266	177	D18(RS3), D15
3. Vocal cords (folds).	266	177	J98, J01, D07
4. Muscles of larynx.	267	179	J11
5. Cricothyroid muscle.	268	180	D98

Short Answers

1. Epiglottis.	264	174	D05(RS2)
2. Inlet of larynx.	266	177	D12(RS3)
3. Rima glottidis (parts and muscles which open it).	266	177	J02
4. Piriform/pyriform fossa—boundaries and applied importance.	267	—	D13
5. Enumerate only intrinsic muscles of larynx.	268	179	J09
6. Cricothyroid muscle—nerve supply and action.	267	180	D10
7. Posterior cricoarytenoids—nerve supply and actions.	267	180	D01, D12

Contd...

Contd...

	BDC Vol: 3	IBSANT3	
8. Name the abductors of vocal cord.	268	180	D16(RS3) ✗
9. Larynx—nerve supply (sensory and motor).	271	181	J06(RS2), D10(RS2), D02, D03, J05, J14

CHAPTER 81: TONGUE

Long Essays

1. Describe the tongue under following headings: (a) Parts, (b) Gross anatomy, (c) Dorsum of tongue, (d) Muscle, (e) Nerve supply, (f) Blood supply, (g) Lymphatic drainage, (h) Development, (i) Applied anatomy.	274	88	D98, J00, D08, J12
2. Name muscles of tongue. Give: (a) Origin, (b) Insertion, (c) Nerve supply, (d) Actions. Add a note on its development.	276	91	D09(RS2) ✗

Short Essays

1. Name the muscles of the tongue and explain their actions and nerve supply.	276	91	D12
2. Tongue—lymphatic drainage.	278	97	D08(RS2), D12(RS3) ✗
3. Tongue—lymphatic drainage and development.	278	97	J11(RS2)
4. Tongue—development and nerve supply.	278	94	D16(RS3) ✗
5. Tongue—sensory and motor nerve supply.	278	94	D06(RS2), D01, J15 ✗

Short Answer

1. Tongue—innervation/nerve supply (sensory).	278	94	J08(RS2), J09(RS2), D15(RS3), D13
---	-----	----	---

CHAPTER 82: EAR

Long Essay

1. Describe the medial and lateral walls of middle ear and add a note on its applied aspects.	290	218	D15
---	-----	-----	-----

Short Essays

1. Tympanic membrane.	285	218	D09(RS2), D98, D00, J12, D12
2. Tympanic cavity.	288	216	D03

Contd...

Contd...

	BDC Vol: 3	IBSANT3	
3. Walls of middle ear.	288	218	D13(RS3) ✗
4. Posterior wall of middle ear.	289	220	D07(RS2) ✗
5. Lateral wall of middle ear.	290	218	J12(RS3) ✗
6. Medial wall of middle ear.	290	220	J07, J10

Short Answers

1. Name the components and medial relations of the tympanic membrane.	285	216	J13
2. Draw only medial wall of middle ear cavity.	289	221	J09
3. Contents of middle ear.	290	216	J00, D01

CHAPTER 83: EYEBALL

Short Essay

1. Cornea.	300	200	D05(RS2)
------------	-----	-----	----------

Short Answer

1. Name the muscles of the eyeball.	302	203	D10
-------------------------------------	-----	-----	-----

CHAPTER 84: MISCELLANEOUS (18)

None

BDC	IBSANT3
Vol: 4	

Section 7: BRAIN

CHAPTER 85: INTRODUCTION

None

■

CHAPTER 86: MENINGES OF BRAIN AND CEREBROSPINAL FLUID

Short Essay

1. Subarachnoid cisterns.	22	105	J15(RS3)
---------------------------	----	-----	----------

Short Answer

1. Mention function of arachnoid granulations.	20	107	D05
--	----	-----	-----

CHAPTER 87: SPINAL CORD

Short Essay

1. Transverse section of spinal cord showing ascending and descending tracts.	37, 38	364	J07
---	--------	-----	-----

Short Answers

1. Cross section of spinal cord to show ascending and descending tracts (only labeled diagram).	37, 38	364	D05(RS2)
2. Sensation carried by posterior column of spinal cord.	42	371	D06

Contd...

Contd...

BDC Vol: 4 IBSANT3

■ CHAPTER 88: CRANIAL NERVES

Long Essays

1. Describe oculomotor nerve under following headings: (a) Origin, (b) Course, (c) Relations, (d) Distribution, (e) Applied anatomy.
2. Describe facial nerve under following headings: (a) Origin, (b) Course, (c) Relations, (d) Distribution.

287 D02, D04

299 J08

Short Essays

1. Describe the extracranial course, distribution of the facial nerve.
2. Facial nerve in face.
3. Left recurrent laryngeal nerve.

71

300

D12

71

300

J05

83

309

D99

Short Answers

1. Enumerate the cranial nerves taking origin from medulla oblongata.
2. Accommodation reflex.
3. Muscles supplied by third cranial (oculomotor) nerve.
4. Muscles affected in oculomotor palsy.
5. Name the branches of the trigeminal nerve in the face.
6. Branches of facial nerve on face.
7. Nerve to stapedius.
8. Chorda tympani nerve (structures supplied).
9. Branches of hypoglossal nerve.

50

350

D14

59

—

D13(RS3)

62

287

D99

62

287

D06(RS2)

68

290

J13

71

300

D07

72

300

J07(RS2)

72

301

J15(RS3), D05, J09

87

312

D09

■ CHAPTER 89: BRAINSTEM

Long Essay

1. Draw a diagram of transverse section of medulla oblongata at sensory decussation and label parts.

94

352

J98

Short Essays

1. Transverse section of medulla at various levels.
2. Draw a neat labeled diagram of medulla oblongata at the level of sensory decussation.

94

351

D16

94

352

D15(RS3), J16(RS3), D03, J07

Contd...

Contd...

BDC Vol: 4 IBSANT3

3. Draw and label the transverse section of medulla oblongata at the pyramidal decussation.
4. Pontine nuclei—location, connections.
5. Section of pons at mid level.
6. Medial lemniscus.
7. Midbrain.
8. Transverse section of midbrain at level of inferior colliculus (draw and label).
9. Labeled diagram showing transverse section of midbrain at level of superior colliculus. Add a note on connections of red nucleus.
10. Superior colliculus.
11. Red nucleus—location, connections.

94

351

97

98

98

99

100

102

101

102

354

356

352

357

358

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

J12(RS3),
D13(RS3), J00,
J10, D15
J06
J04
D05(RS2)
J09(RS2),
J10(RS2)
D07(RS2),
D12(RS3),
D14(RS3), D07
J05(RS2),
J06(RS2),
J08(RS2),
J13(RS3), D00,
J13
D17(RS3)
D11(RS3),
J16(RS3), J99,
J08, J12

Short Answers

1. Nucleus ambiguus.
2. Crus cerebri.
3. Draw transverse section of midbrain at inferior colliculus.
4. Red nucleus.

95

381

100

358

101

359

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

360

■ CHAPTER 90: CEREBELLUM

Short Essays

1. Cerebellum—parts of vermis (divisions) and its functions.
2. Dentate nucleus—situation, shape, connections and functions.
3. Cerebellar peduncles.
4. Superior cerebellar peduncle.
5. Inferior cerebellar peduncle—parts connected, fibers passing through.
6. Functions and applied anatomy of cerebellum.

106

394

109

398

110

397

110

—

110

—

112

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

396

J14(RS3), D09
J02, D04, D07
J07(RS2)
J15
D06(RS2),
J09(RS2),
J13(RS3),
D14(RS3), D99,
J00, D02, J04,
D08
J10, D11

Contd...

Contd...

BDC Vol: 4 IBSANT3

Short Answers

1. Archicerebellum.	106	396	D08(RS2)
2. Enumerate nuclei of cerebellum.	109	398	J10(RS2)
3. Mention any two afferent and efferent fibers present in the middle cerebral peduncle.	110	—	J14
4. Name the tracts in inferior cerebellar peduncle.	110	—	J11

CHAPTER 91: FOURTH VENTRICLE**Short Essays**

1. Discuss the boundaries of the fourth ventricle.	115	432	D13
2. Floor of fourth ventricle (labeled diagram).	115	433	J12(RS3), J06(RS2), D16(RS3), J99, J11, D11, D12
3. Rhomboid fossa (fourth ventricle).	115	432	D09(RS2), J18(RS3), D16

Short Answers

1. Rhomboid fossa—boundaries.	115	432	J09
2. Roof of fourth ventricle.	116	434	D08(RS2)
3. Formation and function of the tela choroidea.	117	429	D13
4. What is cerebral aqueduct? And what is its clinical importance?	117	406	D13

CHAPTER 92: CEREBRUM**Long Essays**

1. Describe the superolateral surface of cerebral hemisphere under the following headings: (a) Lobes, (b) Sulci, (c) Gyri, (d) Functional areas, (e) Blood supply.	124	404	J13(RS3), J14(RS3), J01
2. Describe thalamus and its connections.	134	412	D09
3. Describe corpus callosum. Add a note to its role in cerebral asymmetry.	145	420	J09

Short Essays

1. Draw a neat labeled diagram to show the sulci, gyri, functional areas of the superolateral surface of the cerebrum.	122, 128	404	D13
2. Sulci and gyri of superolateral surface of cerebrum.	124 ??	404	J17(RS3)

Contd...

Contd...

BDC Vol: 4 IBSANT3

3. Functional areas and blood supply of superolateral surface of Cerebrum	126	404	D18(RS3)
4. Lateral geniculate body.	137	416	D98
5. Caudate nucleus.	141	424	D10(RS2), D99
6. Corpus callosum.	145	420	D08(RS2), D11(RS3), D13(RS3), J17(RS3), D01, D03

7. Internal capsule.

146 421 D05(RS2), J03, D06

Short Answers

1. Calcarine sulcus.	125	406	D11(RS3), D12(RS3), J02
2. Which are the parts of the body controlled by the paracentral lobule of the cerebrum?	127	406	J14
3. Speech areas of brain.	128	411	J15(RS3)
4. Broca's motor speech area.	128	411	D12(RS3), J02
5. Sensory speech area in the cerebrum.	128	—	D12
6. Components of basal ganglia.	141	424	D10
7. Name white fibers of cerebrum.	144	418	J11
8. Association fibers of cerebrum.	144	418	D16
9. Mention commissural fibers of cerebral hemisphere.	145	419	D01, J08
10. Corpus callosum (Parts).	145	420	D18(RS3), J15
11. Parts of internal capsule.	146	421	D05

CHAPTER 93: THIRD VENTRICLE, LATERAL VENTRICLE AND LIMBIC SYSTEM**Short Essays**

1. Third ventricle.	151	431	D17(RS3), J05
2. Describe the boundaries of the lateral ventricle.	153	429	J13

Short Answers

1. Inferior horn of lateral ventricle.	155	430	D14
2. Papez circuit of recent memory.	159	—	D09

CHAPTER 94: SOME NEURAL PATHWAYS AND RETICULAR FORMATION**Short Answers**

1. What are gray and white rami communicantes?	—	—	D13
2. Effects of upper motor neuron lesion.	162	366	D08

Contd...

Contd...

CHAPTER 95: BLOOD SUPPLY OF SPINAL CORD AND BRAIN

Long Essay

1. Write diagram of circle of Willis and anterior cerebral artery, and its branches. Name areas that anterior cerebral artery supplies.

Short Essays

1. Spinal cord—blood supply.

2. Circle of Willis (circulus arteriosus).

3. Choroid plexus.

Short Answers

1. Basilar artery (branches).

2. Draw and label circle of Willis.

3. List any four functional areas of the cerebrum supplied by the middle cerebral artery.

4. Choroid plexus.

5. What is subarachnoid hemorrhage? Mention one cause.

IBSEMB KDSN

Section 8: EMBRYOLOGY

CHAPTER 96: SOME PRELIMINARY CONSIDERATIONS

None

CHAPTER 97: GENETICS AND MOLECULAR BIOLOGY IN EMBRYOLOGY

Short Essays

1. Genetic counseling. — — D07(RS2)
2. X-chromosome. — — J08(RS2)
3. Y-chromosome. — — D08(RS2)

Contd...

Contd...

IBSEMB KDSN

4. Gene. 8 5 D15(RS3)
5. Chromosome. 11 7 J06(RS2)
6. Types/classification of chromosomes. 13 7 D13(RS3), D14
7. Karyotyping—principles and applications. 13 8 D08(RS2), J09(RS2), D15(RS3), D17(RS3), J98, J09, J13
8. Abnormalities of chromosome. 14 — J12(RS3)
9. Numerical chromosomal anomalies. 15 — J16(RS3)
10. Down's syndrome/Trisomy 21 (causes and symptoms). 15 8 J13(RS3), J14(RS3), D16(RS3), D99, D11, J14, D15
11. Trisomy 18. 15 8 J11
12. Turner's syndrome. 15 9 J10(RS2), J10
13. Klinefelter's syndrome. 15 9 J05(RS2), D07(RS2), J15(RS3), J17(RS3), D18(RS3)
14. Autosomal dominant inheritance. 16 5 J10(RS2), D11(RS3), J18(RS3)
15. Sex-linked inheritance. 17 — J99
16. Meiosis. 19 12 J15
17. Nondisjunction and its consequences. 21 8 D11(RS3), D16
- Short Answers**
1. RNA—ribonucleic acid. — — J18(RS3)
2. X-chromosome. — — J12(RS3)
3. Y-chromosome. — — D98, J09
4. Genetic counseling. — — J99, D99
5. Anaphase lag. — — D03
6. Robertsonian translocation. — — D18(RS3), D03
7. Aneuploidy. — — D03

Contd...

Contd...	IBSEMB	KDSN
8. Chromosomal bandings.	—	D10
9. Write any three differences between mitosis and meiosis.	—	D02
10. Simian palmar crease.	—	D05
11. Polyploidy.	4	J04
12. Recessive genes.	5	J00, D01, D02, J03
13. Mutation.	5	J07(RS2), J11(RS2)
14. What is Philadelphia chromosome?	8	D09
15. Mendel's law of independent assortment with example.	473	D16(RS3), (IBSANT3) J17(RS3)
16. Genome.	8	J05(RS2)
17. Genetic code.	9	J10
18. Chromosome.	11	D17(RS3), J10, J12
19. Autosomes.	11	D06
20. Sex chromosomes.	11	D06(RS2)
21. Define chromosome. Give the chromosome complement of normal male and female.	11	J00
22. Mention the types of chromosomes based on centromere position.	13	D16
23. What is the difference between meta-centric, submetacentric and acrocentric chromosomes?	13	J03
24. Satellite bodies.	13	J04
25. Karyotyping—diagnostic importance.	13	D98, J05, J12, D15
26. List six acrocentric chromosomes.	14	J07
27. Name the chromosomes with satellite bodies.	14	D01
28. Ring chromosome.	15	D07
29. Mention any three structural abnormalities of chromosomes.	15	J00, J03, D08
30. Name any three syndromes having trisomy.	15	J04

Contd...

Contd...

	IBSEMB	KDSN
31. Translocation.	15	4 J04, D05
32. Define genotype and phenotype.	15	5 D10(RS2), J00, J01, D04, D07, J08, D08
33. Down's syndrome—karyotype and clinical feature.	15	8 D05(RS2), D09(RS2), D10(RS2), J98, D02, D03, D14
34. Klinefelter's syndrome—karyotype, phenotype and clinical feature.	15	9 D08(RS2), J06, D98, J99, D01, D03, D10, D12, J15
35. Turner's syndrome—karyotype, phenotype, causes and clinical features.	15	9 D06(RS2), D99, D00, J02, J04, J07, D07, J12, J13, J14
36. What is pedigree analysis?	16	— D12
37. Name any three autosomal dominant disorders.	16	5 D08
38. Autosomal dominance.	16	5 J00, J02, D10
39. Name any four X-linked inheritances.	17	— J13
40. Mention the examples of X-linked recessive inheritance.	17	— D09, D11
41. Recessive trait.	17	5 D06
42. Name any four autosomal recessive disorders.	17	6 D07
43. Meiosis—stages, significance.	19	12 D05(RS2), D98, J07
44. Monosomy.	21	— D05
45. Nondysjunction.	21	8 D98, J01, J02, J03, D04, D05, J12
46. Consequences of nondisjunction.	21	8 J13
47. Trisomy.	21	8 J07(RS2)
CHAPTER 98: REPRODUCTIVE SYSTEM, GAMETOGENESIS, OVARIAN AND MENSTRUAL CYCLE		
Short Essays		
1. Spermatogenesis.	28	27 J10(RS2), D16
2. Capacitation.	30	51 D11(RS3)

Contd...

Contd...	IBSEMB	KDSN	
3. Oogenesis.	31	29	J09(RS2), D15(RS3)
4. Graafian follicle (formation).	34	31	J11, J13
Short Answers			
1. Name any three investigations for infertility.	29	25	J00, D08, J12, J15
2. Draw and label the structure of a spermatozoon (longitudinal section).	29	28	J02
3. Mention the chromosomal complement of spermatogonium and spermatozoa.	28	27	J07(RS2), D98, J03, J10, D13
4. Spermiogenesis (stages).	29	—	J03
5. Write diagrammatic representation of spermatocytogenesis.	30	51	D00
6. Capacitation.	32	30	D01
7. Write diagrammatic representation of stages in oogenesis.	34	31	D08
8. Graafian follicle (draw and label).	35	35	J15(RS3)
9. Ovulation.	37	37	J10, D12
10. Corpus luteum.			
■ CHAPTER 99: FERTILIZATION AND FORMATION OF GERM LAYERS			
Short Essays			
1. Fertilization and its effects.	46	49	J12(RS3), J11(RS2), J14(RS3), D99
2. Cleavage and morula.	52	54	D15
3. Trophoblast.	52	54	J05(RS2)
4. Blastocyst.	53	54	J11(RS2)
5. Amnion.	55	61	D06(RS2)
6. Primitive streak.	56	61	J16(RS3), J01, D01
7. Explain the formation of intra-embryonic mesoderm and mention the subdivisions.	56, 65	62	D12
8. Trilaminar germ disc.	57	60	D10
9. Gastrulation.	57	62	D12(RS3)

Contd...

Contd...

	IBSEMB	KDSN	
Short Answers			
1. Zygosis.	—	—	J03
2. Fertilization.	46	52	D18(RS3), J08, J13, J15, D15
3. What is the acrosome reaction?	49	51	D10
4. In vitro fertilization.	51	53	D07(RS2)
5. Morula.	52	54	J00, D00, J05
6. Blastocyst.	53	54	D16(RS3), J01, D04, J06, J07, D07, D08, D14
7. Zona pellucida.	54	55	J02, J11
8. Bilaminar germ disc.	55	59	J06(RS2)
9. Prochordal plate.	56	61	D01
10. Primitive streak (formation).	56	61	J07(RS2), D98, J07, J09, D13

■ CHAPTER 100: FURTHER DEVELOPMENT OF EMBRYONIC DISC**Short Essays**

1. <u>Notochord</u> —development, functions and fate.	62	66	D06(RS2), J08(RS2), J13(RS3), D14(RS3), J17(RS3), D18(RS3), D03, D05, D06
2. Mesodermal somites.	67	63	D07(RS2)
3. Septum transversum.	67	166	J01
4. Yolk sac.	67	59, 66	D08(RS2), J09
5. Umbilical cord—formation, contents.	69	90	J04

Short Answers

1. Name the derivatives of notochord.	64	66	J98, J99, J03
2. Give the structure arising from primitive streak.	65	62	D11
3. Division and derivatives of intra-embryonic mesoderm.	65	62	J14(RS3), J12
4. Cloacal membrane.	65	62	J00
5. Somite.	67	63	J06(RS2)
6. What is <u>septum transversum</u> and name the structure derived from it.	67	166	J18(RS3), J12

Contd...

Contd...

	IBSEMB	KDSN	
7. Yolk sac.	67	59, 66	J99, J07, D07, J08
8. Vitellointestinal (viteline) duct.	68	68	J17(RS3), D12

■ CHAPTER 101: PLACENTA, FETAL MEMBRANES AND TWINNING

Short Essays

1. Implantation.	74	56, 75	D13(RS3), J17(RS3), J03
------------------	----	--------	-------------------------

2. Chorionic villi—formation.	79	82	J18(RS3), D13
-------------------------------	----	----	---------------

Short Answers

1. What are the differences between fetal and maternal side of the placenta?	—	—	J13
2. Mention any two types of implantation with examples.	77	81	J02
3. Decidua (name three layers).	78	81	J09, D09
4. Placenta praevia.	78	85	J10(RS2)
5. Ectopic pregnancy.	78	85	D08(RS2)
6. Chorion—formation and fate.	79	61	D15(RS3)
7. Chorionic villi.	81	82	D05(RS2), J08(RS2), J11
8. Name the three types of villi with structural differences in a developing placenta.	81	82	J01, D04, D07
9. Tertiary chorionic villus (labeled diagram).	83	82	D03, D05
10. Placental barrier.	86	83	D11(RS3), J04, J08
11. Functions of placenta.	86	83	D11(RS3), D98, J15
12. Name the fetal membranes.	88	—	D15
13. Amniotic fluids—formation and functions.	89	94	J99, J06
14. Contents of umbilical cord.	91	90	J08(RS2), J99, D06
15. Monozygotic twins.	93	349	D07(RS2)

■ CHAPTER 102: FORMATION OF TISSUES OF THE BODY

Short Answers

1. Name any four derivatives of endoderm.	99	—	D00, J04
2. Mention any four derivatives of mesoderm.	100	—	D02
3. Paraxial mesoderm and its derivatives.	100	63	D98, D08, D13

Contd...

Contd...

■ CHAPTER 103: INTEGUMENTARY SYSTEM (SKIN AND ITS APPENDAGES, MAMMARY GLAND)

None

■ CHAPTER 104: PHARYNGEAL ARCHES

Short Essays

1. First pharyngeal arch (derivatives, nerve of arch).	128	98	D05(RS2), D09(RS2), J14(RS3), D02, J08, J15
2. Second pharyngeal arch (derivatives).	129	102	D11(RS3), D10
3. Tubotympanic recess.	131	106	J05
4. Development of thyroid gland—description with labeled diagram and common congenital anomalies.	133	138	D15(RS3), J06, D09, J10
5. Microscopic structure and development of thyroid gland.	133	138	D06

Short Answers

1. Derivatives of 1st pharyngeal arch, pouch and cleft.	128, 131, 130	102, 106	D16(RS3)
2. Meckel's cartilage and its fate.	128	102	D08(RS2), D09(RS2), J15(RS3), J08(RS2)
3. Derivatives of first pharyngeal arch.	128	98	J17(RS3)
4. Second pharyngeal arch and its derivatives.	129	102	J98, D99
5. Mention the mesodermal (skeletal) derivatives of hyoid (second branchial) arch.	129	102	D05
6. Development of the styloid process of the temporal bone.	129	101	J17(RS3)
7. Mention the derivatives of third branchial arch.	129	101	J12(RS3), J01, D04
8. Development of hyoid bone.	129	101	D07(RS2)
9. Fate of ectodermal clefts.	129	106	D14
10. Name the muscles of first pharyngeal arch.	130	102	J10(RS2), D07
11. Derivatives of first pharyngeal pouch.	131	106	D10(RS2)
12. Derivatives of third pharyngeal pouch.	131	107	J06(RS2)
13. Development of palatine tonsil.	132	107	J98, J10, D12
14. Mention the development of thymus.	132	107	D09(RS2)
15. Development of the parathyroid glands.	133	143	D10(RS2), J99

Contd...

Contd...

	IBSEMB	KDSN	
16. Thyroid gland development.	133	138	J15
17. <u>Thyroglossal duct</u>	133	138	D12(RS3)

■ CHAPTER 105: SKELETAL SYSTEM AND MUSCULAR SYSTEM

Short Essay	138	63	J11(RS2), D16(RS3), J98, D09
1. Somite.			
Short Answers	—	—	D06
1. Clinodactyly.	—	—	D06
2. Webbed neck.	138	63	D11
3. Give the parts of body somites.	138	21	D17(RS3)
4. Sclerotome.	138	21	J12(RS3), D13(RS3), D14(RS3), J07, J11
5. Dermatome			J16(RS3)
6. Myotome.	138	21	

■ CHAPTER 106: FACE, NOSE AND PALATE

Short Essays	152	144	D05
1. Development of the face—description with labeled diagram and its anomalies.			
2. Facial clefts.	157	149	J05
③ Development of palate.	159	152	J17(RS3)
Short Answers			
1. Development of face.	152	144	D08(RS2)
2. Cleft lip.	157	148	D10(RS2)

■ CHAPTER 107: ALIMENTARY SYSTEM I: MOUTH, PHARYNX AND RELATED STRUCTURES

Short Essays	168	133	D07(RS2), D10(RS2), D00, J02, D04, D10, D14
1. Development of tongue and common congenital anomalies.			
2. Tongue—lymphatic drainage and development.	168	133	J11(RS2)
3. Tongue—development and nerve supply.	168	133	D16(RS3)
4. Hypobranchial eminence.	168	133	J12(RS3)

Contd...

Contd...

	IBSEMB	KDSN	
--	--------	------	--

Short Answer

1. Development of tongue.	168	133	J07(RS2), J16(RS3)
---------------------------	-----	-----	-----------------------

■ CHAPTER 108: ALIMENTARY SYSTEM II: GASTROINTESTINAL TRACT

Short Essays	174	171	D12
1. Name the parts derived from the foregut, midgut and hindgut.			
② Developmental derivatives of midgut.	175	171	J11(RS2), J18(RS3)
3. Rotation of gut (midgut).	181	195	D08(RS2), J15(RS3), J14, D14
4. Development of rectum and anal canal.	180	191	J09(RS2)
5. Development of anal canal and anomalies.	180	191	J12
6. Discuss the congenital anomalies associated with umbilicus.	183	92	J14

Short Answers

1. What is allantois and what is its fate after birth?	—	—	D15
② Derivatives of foregut.	174	171	J16(RS3), D17(RS3), J04, D08, J14, J15, D16
3. Derivatives of midgut.	175	171	J08(RS2), D09(RS2), D11(RS3), D14(RS3), J99, J01, J02, J03, D04, D07, J08
4. Derivatives of hindgut.	175	171	J10(RS2), D10(RS2), J00, D00, D03
5. Ventral mesogastrium and its derivatives.	176	177	J06(RS2), J98, D99, J00, D01, J06, J11
6. Name the structures developing in the ventral and dorsal mesogastrium.	176	177	D13
7. Derivatives of the dorsal mesogastrium.	178	177	D02
8. Cecal bud.	179	189	D05
9. Development of cecum.	179	189	D02

Contd...

Contd...

	IBSEMB	KDSN	
10. Development of vermiform appendix.	179	189	D11(RS3), D98
11. How does transverse colon develop?	180	190	J13
12. Development of rectum and anal canal.	180	191	J11(RS2)
13. What are the sources of development of anal canal?	180	191	J13, D15
14. Hirschsprung's disease or congenital megacolon.	183	193	J09
15. Imperforate anus.	183	195	D06
16. What are the complications of the persistent vitelline duct?	183	199	D13
17. Omphalocele.	184	198	J02
18. Situs inversus.	184	202	D06

CHAPTER 109: LIVER AND BILIARY APPARATUS; PANCREAS AND SPLEEN; RESPIRATORY SYSTEM; BODY CAVITIES, AND DIAPHRAGM

Long Essay

- Describe the development of lung. Add a note on its congenital anomalies. 217 160 J14(RS3)

Short Essays

- Blood supply and development of pancreas. 197 186 D14
- Development of pancreas and congenital anomalies. 197 186 J06(RS2), D07(RS2), J09(RS2), J17(RS3), D17(RS3), D18(RS3), J00, D07, D09, D11, D16
- Development of spleen. 199 179 J07(RS2), D11(RS3)
- Development and developmental anomalies of diaphragm. 211 166 D15

Short Answers

- Development of extrahepatic biliary system. 193 183 J17(RS3)
- Development of gallbladder. 193 183 J02
- Development of pancreas. 197 186 J16(RS3), D98, D00, D08, J13
- Ventral pancreatic bud. 197 186 D05
- Parts of pancreas developed from dorsal pancreatic bud. 199 186 J03

Contd...

Contd...

	IBSEMB	KDSN	
6. Annular pancreas.	199	188	J07(RS2)
7. Development of spleen.	199	179	D17(RS3), D98, J10
8. Development of diaphragm.	211	166	J02
9. Maturation of lung.	219	160	J04

CHAPTER 110: CARDIOVASCULAR SYSTEM

Short Essays

- Interatrial septum—development, congenital anomalies, applied anatomy. 233 207 J12(RS3), D16(RS3), J02, D04, J08, J09, J10
- Development of right atrium. 235 208 J09(RS2)
- Fallot's tetralogy. 243 220 D14
- Ligamentum arteriosum. 245 223 D10(RS2), J01, J15
- Arch of aorta—development, and mention one congenital anomaly of it. 245 224 J16(RS3), J06
- Development of portal vein. 252 237 J05(RS2), J10(RS2)

Short Answers

- Septum spurium. 232 208 D14(RS3)
- Development of interatrial septum. 233 207 J13(RS3)
- Septum secundum. 234 207 J16(RS3)
- Fossa ovalis in the fetus. 235 208 D15
- Spiral septum. 236 210 D13(RS3), D17(RS3)
- Mention development of interventricular septum. 237 213 J99
- Fate of sinus venosus. 232 208 J15(RS3), D02
- Probe patency test. 241 — J04
- Fallot's tetralogy (anatomical defect). 243 220 J09(RS2), D01, D03, D10
- What is ductus arteriosus? Give its fate. 245 223 J05(RS2), D07, D09, D15
- What is ligamentum arteriosum? Mention its embryological significance. 245 223 J98, D12
- Development of arch of aorta. 245 224 D1(RS3), J10
- Ductus venosus (functions and fate). 252 237 D03, J07
- Left common cardinal vein (structures developed). 253 239 D09

Contd...

Contd...	IBSEMB	KDSN	
15. Sub cardinal veins.	256	244	J02
16. Shunts in fetal circulation and their fate after birth.	260	249	J14(RS3)
17. Name any two important changes in the fetal circulation soon after birth.	260	—	D02
CHAPTER 111: UROGENITAL SYSTEM			
Short Essays	265	191	
1. Cloaca.	265	256	D12(RS3), J17(RS3)
2. Development of kidney and its anomalies.	265	258	D17(RS3), J99
3. Mesonephric duct—development and derivatives.	266, 284	260	D05(RS2), D99, J05, J10, D13, D15
4. Describe the ascent of the kidney and associated congenital anomalies.	268	268	J05(RS2), D07(RS2), D16(RS3), D09
5. Development and anomalies of urinary bladder.	270	274, 278	D08(RS2), J12(RS3), D16(RS3), J11, D11, J15
6. Paramesonephric duct and its fate in both sexes.	273, 275	274	J14(RS3), J98
7. Development of uterus and its anomalies.	273	279	J13(RS3)
8. Development of external genital organs.	275	283	D13(RS3), D15(RS3), J16(RS3)
9. Testis—development, developmental anomalies and its descent.	278	—	D06
Short Answers			
1. Streak gonads.	—	—	J12
2. Holonephros.	—	—	J03
3. Ectodermal cloaca.	—	—	D06, J09
4. Prostatic utricle (development).	—	272	D10
5. Gartner's duct.	—	295	J12(RS3)
6. Cloaca.	265	191	J08
7. Subdivisions of cloaca.	265	170	J13
8. Name the parts of the kidney derived from metanephric blastema and mesonephric duct.	265	259	J11
9. Ureteric bud.	265	266	J00
10. Name derivatives of ureteric bud.	265	256	D01
11. Name any four derivatives of endodermal cloaca.	265	191	

Contd...

Contd...

	IBSEMB	KDSN	
12. Metanephric blastema.	266	—	J04
13. Mesonephric duct—formation and fate.	266, 286	258	J14(RS3)
14. Name any four development anomalies of kidneys.	269	261	J00, D02
15. Polycystic kidney.	269	264	D06, D07
16. Development of urinary bladder.	270	268	D10
17. Formation and fate of vesicourethral canal.	270	265	D14(RS3)
18. Development of trigone of bladder.	271	268	D05, J08
19. Urachus and its remnants.	271	268	J00
20. What is the fate of the allantois?	271	268	J14
21. Development of prostatic urethra.	271	270	D11
22. Hypospadias.	271	282	D09(RS2), D11(RS3), D07, J14
23. Describe the development of the prostate.	272	272	D02
24. Muellerian duct.	273	278	D05
25. Formation and fate of paramesonephric duct.	273	274, 278	D13(RS3)
26. Development of uterus.	273	274	D09(RS2)
27. Anomalies of development of uterus.	274	276	D13(RS3)
28. Imperforate hymen.	274	278	J09
29. Epispadias.	278	282	D06
30. Derivatives of primordial germ cells.	278	—	J06
31. Processus vaginalis.	281	286	D15(RS3)
32. Anomalies of development of testis.	284	288	J14(RS3)
33. Derivatives of mesonephric duct (in males/females).	286	258	J10(RS2), D10(RS2), D18(RS3), J98, D01, D03, J07, J08, D08, J12
34. Derivatives of paramesonephric duct (in females).	286	274	D06(RS2), D98, D02, J02, J05, J10
35. Name the derivatives of gubernaculum of ovary in females.	286	—	D08
CHAPTER 112: NERVOUS SYSTEM			
Short Essay			
1. Describe the neural tube formation and associated anomalies of the neural tube.	289, 307	65, 297	J15(RS3), J14

Contd...

Contd...	IBSEMB	KDSN	
Short Answer	292	298	J09(RS2), D98, J99, D00, D05, D08
1. Neural crest cells and its derivatives.			

■ CHAPTER 113: ENDOCRINE GLANDS

Short Essays	314	338	J14(RS3)
1. Histology and development of hypophysis cerebri.	315	341	D14(RS3)
2. Development of suprarenal gland.	315	341	J08
3. Development and microscopic structure of suprarenal gland.			

Short Answers	314	338	J10(RS2), J98
1. How hypophysis cerebri is developed?	315	341	J12(RS3), D11, D14
2. Development of adrenal (suprarenal) gland.			

■ CHAPTER 114: DEVELOPMENT OF EYE

None

■ CHAPTER 115: DEVELOPMENT OF EAR

Short Answer	332	321	J06
1. Development of tympanic membrane.			

■ CHAPTER 116: CLINICAL APPLICATIONS OF EMBRYOLOGY

Short Essays	343	96	J09(RS2), D12
1. Prenatal diagnosis—purpose and methods.	344	95	D14(RS3)
2. Amniocentesis.			

Short Answers	343	—	J06
1. Name two teratogens.	343	96	J12(RS3), J01, D01, D04, D08, D09, J14
2. Prenatal diagnosis (different types, name two techniques).			

IBSHST DFJOR

Section 9: HISTOLOGY

■ CHAPTER 117: LIGHT MICROSCOPY AND TISSUE PREPARATION

None

■ CHAPTER 118: CELL STRUCTURE

Short Essay	18	—	J07(RS2)
1. Sex chromatin.			

Contd...

Contd...

	IBSHST	DFJOR	
--	--------	-------	--

Short Answers

1. Mitochondria.	13	25	D09(RS2), J99, D00, D02
2. Golgi apparatus/body.	14	30	J99, J02
3. Centrioles.	17	17	J03, J11
4. Barr body (sex chromatin).	18	—	J05(RS2), J09(RS2), D10(RS2), J11(RS2), D12(RS3), J98, D99, J00, D02, D05, J06, J08, D11, D14, J15

■ CHAPTER 119: EPITHELIA

Short Essay

1. Transitional epithelium (urothelium).	32	50	J04, D11
--	----	----	----------

Short Answers

1. Simple squamous epithelium.	26	45	J11
2. Draw a labeled diagram of transitional epithelium (urothelium).	32	50	J01, D04, D07
3. Draw and label the microscopic structure of pseudostratified columnar ciliated epithelium.	30	49	D11
4. Stratified squamous epithelium.	30	51	D08(RS2)
5. Draw a labeled diagram of the stratified squamous keratinized epithelium.	31	54	D13
6. Name the three sites of stratified squamous nonkeratinized epithelium.	32	44	J08
7. Transitional epithelium (urothelium).	32	50	J09(RS2), J10(RS2), D18(RS3), D98, J09
8. Name the types of cells present in the transitional epithelium and mention their functions.	32	50	J13
9. Basement membrane.	34	43	J99
10. Microvilli.	35	22	J98, D14
11. Brush border.	36	—	J11

Contd...

Contd...

IBSHST DFIOR

■ CHAPTER 120: GLANDS

Short Answers

1. Mucus acinous. 38 62 J11
2. Classify glands according to mode of secretion with one example each. 37 56 J14(RS3)

■ CHAPTER 121: GENERAL CONNECTIVE TISSUE

None

■ CHAPTER 122: CARTILAGE

Short Essays

1. Microscopic anatomy of the hyaline cartilage. 57 112 J15(RS3), D16(RS3), J02, D04, D12
2. Microscopic structure of elastic cartilage. 58 114 J12(RS3), J16(RS3), D08(RS2), D16

Short Answers

1. Perichondrium. 54 110 J17(RS3)
2. Examples of the hyaline cartilage in the body. 56 109 D98, D03
3. Labeled diagram of hyaline cartilage. 57 113 J05(RS2), J06, J12
4. Articular cartilage—structure. 58 114 D07
5. Give any four features of hyaline cartilage. 56 109 D00
6. Neat labeled diagram of microstructure of elastic cartilage. 58 114 D13
7. Differences between hyaline and elastic cartilage. 57 109 D12
8. Histology of (white) fibrocartilage (draw and label). 59 116 J07, D11
9. Elastic cartilage (examples). 58 109 J99, J04

■ CHAPTER 123: BONE

Short Essays

1. Haversian system. 65 122 D09
2. Microscopic structure of transverse section of compact bone (labeled diagram, distinguishing features). 67 136 J18(RS3), J06, J13

Contd...

Contd...

IBSHST DFIOR

Short Answers

1. Name three types of cells in the bone and their locations. 61 123 J01, D04
2. Draw a labeled diagram of haversian system. 66 136 D00
3. Draw a labeled diagram of the microscopic structure of compact bone. 67 136 J08(RS2), D13(RS3), J14(RS3), J02

■ CHAPTER 124: MUSCULAR TISSUE

Short Essays

1. Microscopic structure of skeletal muscle. 76 145 D15
2. Microscopic structure of cardiac muscle. 85 157 J11(RS2)

Short Answers

1. Sarcomere. 78 150 D16(RS3), D98
2. Draw and label microscopic structure of sarcomere. 79 150 J12
3. Any three differences between histology of skeletal and cardiac muscle. 87 145, 157 J08
4. Histology of cardiac muscle. 85 157 J12(RS3), J07
5. Intercalated disk. 85 157 D98

■ CHAPTER 125: LYMPHATICS AND LYMPHOID TISSUE

Short Essays

1. Microscopic structure of lymph node (labeled diagram, specific distinguishing features). 96 242 J05(RS2), J17(RS3), D18(RS3), J98, D99, D01, J05, D05, D06
2. Microscopic structure of palatine tonsil (neat labeled diagram). 104 256 D07(RS2), D08(RS2), J18(RS3), D09, D13

Short Answers

1. Role of colchicin in lymphocyte culture. — — D10
2. Mention two histological differences between spleen and tonsil. 97, 104 254, 256 D05
3. Microscopic structure of lymph node (draw a neat labeled diagram). 96 242 J07(RS2), D11(RS3), J13(RS3), D14(RS3), J00, J08, D15

Contd...

Contd...	IBSHST	DFIOR	
4. Microscopic structure of spleen (Draw and label).	98	254	D16(RS3), D04, D10
5. White pulp of spleen.	99	256	D08, D11
6. Red pulp.	99	256	J04
7. Hassel's corpuscles (location and embryological significance).	102	252	J98, J07, D10
8. Draw and label microscopic structure of palatine tonsil.	104	257	J10(RS2), J16(RS3)
9. Labeled diagram of the microscopic structure of thymus.	101	251	D17(RS3), D02, J12, J15

CHAPTER 126: NERVOUS SYSTEM

Short Essays

1. Microscopic anatomy of transverse section of peripheral nerve.	111	202	D12(RS3) ✗
2. Draw and label the microstructure of the sensory ganglion.	116	210	J14
3. Microscopic anatomy of sympathetic ganglion.	117	210	D10
4. Microscopic anatomy of cerebellum.	121	185	D15(RS3), D15
5. Describe the microscopic structure of cerebrum.	124	185	J14(RS3) ✗

Short Answers

1. Nissl's substance.	106	180	J00, D00, D01
2. Three differences between structure of spinal ganglion and autonomic ganglion.	116	—	D07
3. Dorsal root ganglion.	115	210	D12
4. List four typical microscopic anatomical features of the dorsal root ganglion.	116	210	J07
5. Draw and label microscopic structure of spinal ganglion.	116	210	D07(RS2) ✗
6. Draw a labeled diagram of microscopic structure of cerebellar cortex.	121	185	J10
7. Name the layers of the cerebral cortex.	123	184	D10

CHAPTER 127: SKIN AND ITS APPENDAGES

Short Essays

1. Microscopic structure of thin skin (labeled diagram) difference from the thick skin.	127	266	J03
---	-----	-----	-----

Contd...

Contd...

	IBSHST	DFIOR	
2. Draw and label microscopic structure of thick skin.	128	273	D11(RS3)

Short Answer

1. Myoepitheliocytes.	136	270	D10(RS2)
-----------------------	-----	-----	----------

CHAPTER 128: THE CARDIOVASCULAR SYSTEM

Short Essay

1. Muscular artery—microscopic anatomy.	143	224	D06(RS2)
---	-----	-----	----------

Short Answers

1. Name the layers found in the wall of a vessel.	140	217	D10
2. Give three differences in the structure of elastic artery and muscular artery.	140	217	D08
3. Draw and label microscopic structure of elastic artery (large artery).	142	227	D08(RS2), J09(RS2), D18(RS3) ✗
4. Labeled diagram of histology of muscular artery (medium-sized artery).	143	225	D09(RS2), D03, J07, J12, D15

CHAPTER 129: THE RESPIRATORY SYSTEM

Short Essays

1. Describe the microscopic structure of trachea.	154	400	J14(RS3), D17(RS3)
2. Microscopic anatomy of lung.	156	402	D05(RS2), D13(RS3), D14(RS3) ✗

Short Answers

1. Microscopic structure of trachea.	154	400	J06(RS2), J09
2. Microscopic appearance of lung (only labeled diagram).	156	402	J02

CHAPTER 130: DIGESTIVE SYSTEM: ORAL CAVITY AND RELATED STRUCTURES

Short Essays

1. Microscopic anatomy of tongue.	166	288	J13(RS3) ✗
2. Histology of parotid gland.	169	302	J10(RS2) ✗
3. Microscopic structure of submandibular salivary gland.	170	304	D11(RS3)

Short Answers

1. Circumvallate papillae.	165	288	J11
----------------------------	-----	-----	-----

Contd...

Contd...

	IBSHST	DFIOR	
2. Microscopic structure of tongue.	166	288	J12(RS3)
3. Microscopic appearance of lingual papillae (only labeled diagram).	167	289	D02
4. Draw and label taste bud.	167	291	J08(RS2)
5. Labeled diagram of microscopic structure of serous salivary glands (parotid gland).	169	303	D16(RS3), D01, D14
6. Draw and label microscopic structure of mixed salivary gland.	170	305	J12

CHAPTER 131: DIGESTIVE SYSTEM: ESOPHAGUS, STOMACH AND INTESTINES

Short Essays

1. Microscopic structure of jejunum.	184	348	J05
2. Microscopic structure of <u>duodenum</u> .	187	344	J07(RS2), D07(RS2), * D13(RS3), D18(RS3), J98, J10, D10
3. Microscopic structure (histology) of ileum (Draw and label).	188	350	J08(RS2), D11, D16
4. Microscopic structure of the vermiform <u>appendix</u> .	191	360	J05(RS2), * J10(RS2), J18(RS3), D13, D14

Short Answers

1. Muscularis mucosa and its functions.	175	313	J00
2. Esophageal glands.	176	314	J03
3. Fundic glands of stomach.	178	330	J00, D02
4. Name the cells present in fundic part of stomach and give their secretion.	178	332	D07
5. Histology of <u>fundic part of stomach</u> .	180	324	D07(RS2), * J12(RS3), D05
6. Diagram of histology of pyloric end of stomach.	181	335	D03
7. Plicae circulares.	—	341	D15(RS3)
8. Intestinal glands.	184	341	D15(RS3)
9. Crypts of Lieberkuhn.	184	341	D01
10. Goblet cell.	185	47	J15
11. Peyer's patches.	186	342	J00, J03, J11

Contd...

Contd...

	IBSHST	DFIOR	
12. Duodenal glands of Brunner.	187	342	J02, J04
13. Give any three differences in the structure of duodenum and jejunum.	187	342	D08
14. Neat labeled diagram of microscopic structure of jejunum.	184	349	J01, D04, D06
15. Draw and label microscopic structure of duodenum.	187	345	D08(RS2), D09
16. Microscopic structure of ileum.	188	350	J11(RS2), D98, D03
17. Histological structure of vermiform appendix (only labeled diagram).	191	360	J09(RS2), J03, J07, J12

CHAPTER 132: HEPATOBIILIARY SYSTEM AND PANCREAS

Short Essays

1. Microscopic structure of liver (draw and label).	194	370	D05(RS2), D08(RS2), * D10(RS2), J15(RS3), D17(RS3), J08, J13, J15
2. Gallbladder—microscopic structure and applied anatomy.	199	384	D09
3. <u>Microscopic structure of pancreas</u> .	201	378	J08(RS2), J10(RS2), * D16(RS3)

Short Answers

1. Differentiate hepatic lobule from portal lobule.	193	367	J99
2. Draw and label classical lobule of liver.	195	373	D07
3. Portal lobule.	193	367	J12
4. Portal triad (constituents).	193	367	J11
5. Neat labeled diagram of histological structure of liver.	194	371	D11(RS3), D00, J03
6. Histology of gallbladder.	199	384	J09(RS2), D06, D10
7. Microscopic structure of pancreas (neat labeled diagram).	201	378	D14(RS3), D98, J04, J05, D05
8. Islets of Langerhans.	202	380	J15
9. Name the types of cells present in islet of Langerhans and what do they secrete?	202	380	J14

Contd...

Contd...

IBSHST DFIOB

CHAPTER 133: THE URINARY SYSTEM

Short Essays

1. Microscopic structure of kidney (draw and label). 205 420 J05(RS2), J12(RS3), D12(RS3), D14(RS3), J17(RS3), D15
2. Microscopic structure of ureter. 214 438 J09
3. Microscopic anatomy of urinary bladder (draw and label). 215 443 J16(RS3), D12

Short Answers

1. Diagram of histology of kidney. 205 421 J04, J06
2. Diagram showing parts of nephron (name the parts). 206 — J02, J14
3. Renal corpuscle (Malpighian corpuscle) 206 417 D98, J11
4. What are podocytes? Mention its functions. 208 — J99
5. Histology of medulla of kidney. 209 437 D06
6. Mention the lining epithelium of loop of Henle. What is its functional significance? 209 425 J98
7. Juxtaglomerular apparatus. 211 426 D02
8. Microstructure of ureter. 214 438 D05(RS2), J08(RS2), D10(RS2), J11(RS2), D99, J01, J03, D05, J06, D08
9. Diagram of histology of urinary bladder. 215 443 D08(RS2), D01, D03

CHAPTER 134: MALE REPRODUCTIVE SYSTEM

Short Essays

1. Microscopic structure of testis (draw and label). 218 480 D07(RS2), J13
2. Microscopic structure of epididymis. 225 486 J11
3. Microscopic structure of vas deferens. 226 488 D08(RS2)

Contd...

Contd...

IBSHST DFIOB

4. Histology of the prostate with a neat labeled diagram. 229 496 J14

Short Answers

1. Microscopic appearance of testis (only labeled diagram). 218 480 D11(RS3), J12(RS3), D17(RS3), D02
2. Mention the functions of cells of Sertoli. 220 479 J02, D12
3. Interstitial cells of Leydig. 220 477 D03
4. Microscopic structure of epididymis (draw and label). 225 486 D09(RS2), D18(RS3), D06
5. Mention two histological features of epididymis. 225 486 D99
6. Microscopic structure of vas deferens. 226 488 J06(RS2), J08(RS2), D98
7. Corpora amylacea. 228 — D03
8. Microscopic structure of prostate gland (neat labeled diagram). 229 496 J14(RS3), D01, J04, D05

CHAPTER 135: FEMALE REPRODUCTIVE SYSTEM

Short Essays

1. Microscopic structure of the placenta. A40 544 J09(RS2)
2. Microscopic structure of ovary. 233 508 J06(RS2), D09(RS2), D11(RS3), J13(RS3), J14(RS3), D15(RS3), D99, D12, D13
3. Microscopic anatomy of the uterine tube (Fallopian tube)—draw and label. 238 520 D15
4. Microscopic structure of uterus (Draw and label). 239 524 J07(RS2), D16

Short Answers

1. Microscopic structure of placenta (labeled diagram only). A40 544 J03
2. Microscopic structure of ovary (Draw and label). 233 508 J18(RS3), D98
3. Draw and label microscopic structure of Graafian follicle. 235 514 J10(RS2)
4. Corpus luteum (draw and label). 236 516 J00

Contd...	IBSHST	DFIOR	
5. Microscopic structure of fallopian tube (draw and label).	238	520	J12(RS3), D15(RS3), J17(RS3), D00, J02, D06, D07, J12
6. Draw a neat labeled diagram of microscopic anatomy of uterus.	239	524	D13(RS3)
7. Endometrium.	240	506	J17(RS3)
8. Microscopic appearance of endometrium in secretory phase (only labeled diagram).	240	526	D01

■ CHAPTER 136: ENDOCRINE SYSTEM

Short Essays

1. Microscopic structure of pituitary gland.	250	454	D09(RS2), D02
2. Histology and development of hypophysis cerebri.	250	454	J14(RS3)
3. Microscopic structure and development of thyroid gland.	255	464	D06
4. Microscopic structure (histology) of thyroid gland.	255	464	J07(RS2), J08(RS2), D10
5. Development and microscopic structure of suprarenal gland.	260	470	J08
6. Microscopic structure of the suprarenal gland.	260	470	D06(RS2), D11(RS3), J09, D10

Short Answers

1. Microscopic appearance of hypophysis cerebri (only labeled diagram).	250	454	D01
2. What are the secretions from the basophilic cells of the pituitary gland?	252	458	J14
3. Draw a labeled diagram of histology of a thyroid follicle.	256	465	D05
4. Microscopic structure of suprarenal gland.	260	470	J02, D05

■ CHAPTER 137: SPECIAL SENSES: EYE

Short Essay

1. Describe the microscopic structure of cornea.	267	562	D16(RS3)
--	-----	-----	----------

Contd...

Contd...

Short Answer

1. Microscopic appearance of cornea (only labeled diagram).	267	562	D02
---	-----	-----	-----

■ CHAPTER 138: SPECIAL SENSES: EAR

None

■ MISCELLANEOUS

Short Answer

1. Labeled diagram of the microscopic structure of umbilical cord.	—	—	D07(RS2), J10(RS2)
--	---	---	--------------------

2

PHYSIOLOGY

REFERENCES

1. GK Pal (GKPAL): Comprehensive Textbook of Medical Physiology—Two volumes (1th Edition), Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, ₹ 1395/-
2. AK Jain (AKJN): Textbook of Physiology—Two volumes (7th Edition), Avichal Publishing Company, Kala Amb (HP), ₹ 1450/-

COURSE CONTENTS

THEORY

- I. General physiology
 1. Homeostasis, concepts of physiological norms, range and variations, active and passive transport, relationship between stimulus and response.
 2. Structure of cell membrane, resting membrane potentials, cellular receptors and intercellular communications.
 3. Body fluids—compartments, changes in body fluid compartments, hypo-proteinemia, replacement of body fluid loss.
- II. Body fluids—blood
 1. Blood composition, cellular elements of blood, their formation and regulation.
 2. Hemoglobin—synthesis and functions, jaundice, anemia and their classification.
 3. Hemostatic mechanisms, anticoagulants.
 4. Blood groups, Rh incompatibility, blood transfusion.
 5. Erythrocyte sedimentation rate.
 6. Basic mechanisms of immunity and functions of WBCs.
 7. Lymph—composition, circulation and functions.
- III. Nerve and muscle
 1. Classification of nerves, muscle.
 2. Structure of skeletal muscle, types of muscle fibers.
 3. Mechanism of contraction and its molecular basis, thermal and chemical changes during muscle contraction.
 4. Oxygen debt.
 5. Neuromuscular transmission, neuromuscular blocking drugs.
 6. Neuromuscular disorders, pathophysiology of myasthenia gravis.
 7. Smooth muscle—structure, mechanism of contraction and nerve supply and neurotransmitters.
- IV. Gastrointestinal tract
 1. Functional morphology.
 2. Functions, regulation of secretion of salivary glands, stomach, small intestine and large intestine.
 3. Regulation of gastrointestinal movements.
 4. Functions of gallbladder, liver.
 5. Site of production and action of gastrointestinal hormones.
 6. Mechanisms—intestinal absorption of food.
 7. Physiological basis of peptic ulcer, diarrhea and constipation, motility disorders—achalasia, Hirschsprung's disease.
- V. Kidney
 1. Functions of different parts of nephron in urine formation.
 2. Role of kidney in water and electrolyte balance, acidification of urine.
 3. Diuresis, kidney function tests.
 4. Juxtaglomerular apparatus and renin-angiotensin system.
 5. Renal blood flow.
 6. Structure and innervation of bladder, micturition, cystometrogram and disorders of micturition.
 7. Principles of artificial kidney.

VI. Skin and body temperature (environment)

1. Structure and functions of skin.
2. Regulation of body temperature.

VII. Endocrine glands

1. General principles of regulation of endocrine glands.
2. Hormones, functions, cellular mechanism of hormone action, regulation of secretion.
3. Experimental and clinical disorders of anterior and posterior pituitary, thyroid, parathyroid, adrenal cortex and medulla and endocrine pancreas.
4. Stress and hormones.
5. Physiology of growth.
6. Minor endocrine glands—pineal body, heart and kidney.

VIII. Reproduction

Sex determination and differentiation.

Male reproduction:

1. Functions of testis.
2. Constituents of semen.
3. Testicular hormones.
4. Spermatogenesis and regulation.

Female reproduction:

1. Menstrual cycle; changes in ovary; uterus, cervical mucus, vagina and hormonal regulation.
2. Ovulation and its detection.
3. Fertilization, implantation, physiological changes during pregnancy, fetal-placental unit, nutritional needs of mother during pregnancy, parturition, placenta, menopause.
4. Lactation, composition of breast milk.
5. Physiology of newborn.

Family planning and welfare:

1. Physiological basis of contraception in males and females.
2. Principles of use of oral contraceptives, safe period, rhythm and other methods of contraception.

IX. Cardiovascular system

1. Functional anatomy of heart.
2. Properties of cardiac muscle.
3. Principles of electrocardiography.
4. Electrical and mechanical changes in cardiac cycle.
5. Conducting system of heart.
6. Normal ECG.
7. Cardiac output and its measurement in man, physiological variations.
8. Regulatory mechanisms of heart rate and blood pressure.
9. Regional circulation: Normal values, physical principles governing flow of blood in heart and blood vessels, measurement and regulation of coronary, cerebral, skin.
10. Changes in CVS during muscular exercise, postural changes, hypovolemia, hypoxia and cardiopulmonary resuscitation.
11. Microcirculation, hemodynamics.
12. Pathophysiology of hypertension, shock, cardiac failure and coronary artery disease.

X. Respiratory system

1. Functional anatomy of respiratory system.
2. Mechanics of normal respiration.
3. Physical principles governing flow of air in respiratory passages.
4. Lung compliance, alveolar ventilation, ventilation-perfusion ratio.
5. Oxygen and carbon dioxide transport.
6. Diffusing capacity, pulmonary function tests.
7. Regulation of respiration.
8. Respiratory acidosis and alkalosis.
9. Pulmonary blood flow.
10. Hypoxia, cyanosis, asphyxia.
11. Respiratory adjustments during muscular exercise, hyperbaric conditions.
12. Principles of oxygen therapy, artificial respiration.
13. Hyaline membrane disease.
14. Pathophysiology of obstructive and restrictive disorders, pulmonary edema, decompression sickness, hyperbaric oxygen therapy, dyspnea.

XI. Central nervous system

1. Organization of the central nervous system.
2. Functions and neuronal organization at spinal cord level.
3. Synaptic transmission.
4. Motor and sensory systems and their lesions.
5. Reticular system in brainstem, sleep, wakefulness.
6. EEG waves and physiological changes in EEG.
7. Clinical lesions and experimental sections at spinal cord, brainstem and subcortical levels.
8. Physiology of basal ganglia, cerebellum, thalamus, hypothalamus, limbic system, prefrontal lobe and cerebral cortex.
9. Speech and its disorders.
10. Autonomic nervous system.
11. Formation and functions of CSF, blood-brain barrier.
12. Central neurotransmitters, neuroglia.
13. Physiological basis of CNS disorders like Alzheimer's disease, Parkinsonism, syringomyelia, tabes dorsalis.

XII. Special senses

Eye

1. Functional anatomy of eye.
2. Image formation on retina.
3. Structure of photoreceptors, electrical activity of photoreceptors.
4. Errors of refraction.
5. Functions of aqueous humor, intraocular tension.
6. Mechanisms of accommodation, dark adaptation, pupillary reflexes.
7. Functions of retina.
8. Optic pathway and lesions, role of visual cortex in perception.
9. Field of vision—color vision, acuity of vision and photochemistry of vision.
10. Nutritional deficiency—blindness.
11. Structure of photoreceptors, generator potentials of rods and cones.

Auditory apparatus

1. Functional anatomy of ear.
2. Physics of sound (basic).
3. Role of tympanic membrane, middle ear and cochlea in hearing.
4. Auditory receptors and pathway.
5. Deafness and its causes.
6. Principles of audiometry, tuning fork tests and its interpretation.

Vestibular apparatus

1. Structure and functions, connections and lesions of vestibulocochlear apparatus.

Taste and smell

1. Modality, receptors and pathway of taste and smell.
2. Cortical and limbic areas associated with taste and smell.

XIII. Biomedical waste

1. Types, potential risk and their safe management.

PRACTICAL**Procedure to be Performed by the Students****I. Hematology**

1. RBC count.
2. WBC count.
3. Differential leukocyte count.
4. Estimation of hemoglobin.
5. Blood grouping.
6. Bleeding time.
7. Clotting time.
8. Absolute eosinophil count.
9. Erythrocyte sedimentation rate.
10. Determination of blood indices—MCV, MCH, MCHC and color index.

II. Human physiology

1. Mosso's ergometry—at normal condition, after venous occlusion and arterial occlusion.
2. Recording of blood pressure, effect of posture and exercise on it.
3. Stethography—at rest, effect of deglutition, exercise, voluntary hyperventilation and break point after breath holding, breathing through long tube, rebreathing through bag.
4. Spirometry—lung volumes and capacities, MVV and dyspneic index, FEV1.
5. Peak expiratory flow rate (PEFR) by Wright's mini peak flow meter.
6. Cardiovascular fitness test—by Harvard's step test or bicycle ergometer or 2 km walk.
7. Visual field by perimetry.
8. Body composition—BMI (by Quetlet's Index) and body fat % by Durenberg's equation.
9. Recording of ECG in lead II.
10. Tests of autonomic functions.

III. Clinical examination

1. Examination of radial pulse.
2. Clinical examination of cardiovascular system.
3. Clinical examination of respiratory system.
4. Examination of cranial nerves.
5. Examination of sensory system.
6. Examination of motor system.
7. Examination of reflexes.

IV. Interpretation of charts, problems and case histories.**Demonstrations****I. Hematology**

1. Hematocrit.
2. Reticulocyte count.
3. Platelet count.
4. Osmotic fragility.

II. Nerve-muscle physiology

1. Electromyography (EMG).

III. Cardiovascular system

1. Electrocardiography (ECG).
2. Demonstration of sinus arrhythmias.
3. Recording of arterial pulse tracing.

IV. Respiratory system

1. Determination of lung volumes and capacities and other lung function tests by computerized spirometry.

V. Reproductive system

1. Sperm motility and sperm count.

VI. Special senses

1. Audiometry.
2. Purkinje-Sanson images.
3. Ophthalmoscopy, retinoscopy.
4. Examination of fundus.

VII. Nervous system

1. Autonomic function tests.
2. Electroencephalogram (EEG).

VIII. Amphibian practical

1. Muscle—nerve and heart experiments if feasible for academic interest only (Graphs on amphibian experiments for university practical examination are deleted).

UNIVERSITY EXAMINATION PATTERN**Eligibility for Writing the University Examination**

The candidate should have at least 35% aggregate in the two of the three internals conducted by the college and should also have minimum 75% attendance in Theory and Practical classes conducted.

Criteria for Passing the University Examination

- The candidate should secure minimum 50% in the university theory examination (University theory + Viva voce) and the university practical examinations separately.
- Candidate should also score 50% in Group A (University theory + Viva voce) and Group B (University Practical + Internal Assessment Theory and Practical).
- Class of passing would be determined from total of Group A + Group B. (Distinction—75% and above; First Class—65%–74.9%; Pass Class—50%–64.9%; Fail—<50%)

Distribution of Marks

	Internal assessment		University examination	
	Maximum marks	Minimum marks to qualify	Maximum marks	Minimum marks to pass
Theory examination	40 marks	14 marks	200 marks	120 marks
Viva voce	—	—	40 marks	—
Practical examination	40 marks	14 marks	80 marks	40 marks

THEORY EXAMINATION

There shall be two papers each carrying 100 marks. The pattern of questions would be of three types.

2 Long Essay Questions	2 × 10 marks	20 marks
10 Short Essay Questions	10 × 5 marks	50 marks
10 Short Answer Questions	10 × 3 marks	30 marks
Total		100 marks

Distribution of Chapters in Paper I and II for University Examination with Weightage of Marks

Paper I		Paper II	
Topics	Marks	Topics	Marks
General physiology	4	Endocrine	20
Blood	20	Special senses	20
Cardiovascular system	24	Reproduction	12
Respiratory system	20	Central nervous system	28
Gastrointestinal system	20	Muscle-nerve physiology	16
Renal system	12	Skin and body temperature	10

(Note: Marks for renal and gastrointestinal system can be interchanged.) (Note: Marks for endocrine and reproduction can be interchanged.)

(Topics assigned to the different papers are generally evaluated under those sections. However, a strict division of the subject may not be possible and some overlapping of topics are inevitable and students are advised to be prepared to answer overlapping topics.)

PRACTICAL EXAMINATION

Practical examination consists of two sessions of 2 hours duration and 40 marks each.

Distribution of Practicals in Session I and II for University Examination with Marks

	Marks
I. Exercise I	
a. Clinical examination	20 marks
b. Procedures on human subjects	20 marks
II. Exercise II	
a. Hematology	
i. Major	20 marks
ii. Minor	10 marks
b. Interpretation of case histories/problems/charts	10 marks

Viva Voce

The viva voce examination shall carry 40 marks (portion of each paper carrying 20 marks) and all the examiners will conduct the viva examination separately for each candidate.

Question Bank

GKPAL AKJN

Section 1: GENERAL PHYSIOLOGY

■ CHAPTER 1: DEFINING THE ROLE OF PHYSIOLOGY IN MODERN MEDICINE

None

■ CHAPTER 2: FUNCTIONAL ORGANIZATION OF HUMAN BODY

None

■ CHAPTER 3: PRINCIPLES OF HOMEOSTASIS

Short Essays

- | | | | |
|--|----|---|--------------------|
| 1. Explain the role of 'positive feedback' regulation in endocrinology with one example. | 10 | 5 | D05(RS2), D13(RS3) |
| 2. What are negative feedback loops? | 11 | 5 | D09(RS2), J13(RS3) |

Short Answers

- | | | | |
|--|--------|---|---------------|
| 1. Define "homeostasis" and "hemostasis". | 9, 196 | 4 | D98 |
| 2. Homeostasis (define and give one example). | 9 | 4 | J13(RS3), D05 |
| 3. What is homeostasis? Describe positive feedback mechanism with suitable examples. | 9 | 4 | D07 |
| 4. Give examples for 'negative feedback' and 'positive feedback' mechanisms in the body. | 10 | 5 | D12 |
| 5. Explain the positive feedback mechanism of hormonal regulation with a suitable example. | 10 | 5 | D10(RS2), J02 |
| 6. Explain with the help of examples "negative feedback" mechanism of hormonal regulation. | 11 | 5 | J00 |

■ CHAPTER 4: CELLULAR ORGANIZATION AND INTERCELLULAR CONNECTIONS

Short Essay

- | | | | |
|--|----|----|--|
| 1. Intercellular connections (cell junctions). | 24 | 10 | D09(RS2), D11(RS3), J17(RS3), D18(RS3) |
|--|----|----|--|

Short Answers

- | | | | |
|--|---|---|-----|
| 1. Enumerate various structures present in a cell (cell organelles). Give their functions. | — | 5 | D07 |
|--|---|---|-----|

Contd...

Contd...

- | | GKPAL | AKJN | |
|---|--------|------|-------------------------|
| 2. Structure of cell with a neat diagram. | 13 | 5 | J00 |
| 3. List the functions of cell membrane. | 16 | 7 | J13 |
| 4. Outline the structure of mitochondria and its function. | 16 | 9 | D15 |
| 5. Write the functions of 'endoplasmic reticulum'. | 17 | 8 | D13 |
| 6. Mention the functions of: (a) Mitochondria, (b) Golgi apparatus. | 17, 18 | 9 | D09 |
| 7. Suicidal bags of a cell. | 18 | 9 | D16(RS3) |
| 8. Mention the functions of: (a) Ribosomes, (b) Lysosomes. | 20, 19 | 9 | D02 |
| 9. Intercellular communication. | 24 | 22 | D15(RS3), D16(RS3), D10 |

■ CHAPTER 5: PHYSIOLOGY OF GENETICS AND APOPTOSIS

Short Answer

- | | | | |
|-----------------------|----|----|----------|
| 1. What is apoptosis? | 37 | 12 | D07(RS2) |
|-----------------------|----|----|----------|

■ CHAPTER 6: TRANSPORT ACROSS THE CELL MEMBRANE

Short Essays

- | | | | |
|---|--------|--------|------------------------------|
| 1. Compare and contrast active transport with facilitated diffusion. | — | — | D14 |
| 2. Transport across the cell membrane. | 40 | 14 | J18(RS3), J99 |
| 3. Enumerate various transport mechanisms across cell membrane. Explain (primary) active transport with an example. | 44, 50 | 14, 18 | D07(RS2), J12(RS3) |
| 4. Facilitated diffusion—define and factors affecting it. | 46 | 15 | D13(RS3), J16(RS3) |
| 5. Na ⁺ -K ⁺ pump. | 50 | 18 | J08(RS2) |
| 6. Secondary active transport (define, factors affecting with examples). | 53 | 20 | D12(RS3), J14(RS3), J15(RS3) |
| 7. Exocytosis and endocytosis. | 54 | 21 | J13(RS3) |
| 8. Explain endocytosis. | 54 | 21 | D08 |
| 9. Describe the different steps of phagocytosis. | 55 | 88 | D01, D12 |

Short Answers

- | | | | |
|--|---|--------|-----|
| 1. What is difference between diffusion and osmosis? Give an example for each. | — | 14, 17 | J02 |
|--|---|--------|-----|

Contd...

Contd...	GKPAL	AKJN	
2. Name 'voltage gated' channels and 'ligand gated' channels.	41	16	J05
3. Explain ligand gated channel with example.	42	16	D03
4. Compare and contrast active transport mechanism and passive transport mechanism.	44	—	D02, J03, J14
5. Simple diffusion.	44	14	D14(RS3)
6. Four factors affecting rate of (simple) diffusion across cell membrane.	45	15	D10, D13
7. Explain facilitated diffusion with an example. How does it differ from simple diffusion.	46	15	J05(RS2), D09(RS2), J11(RS2), J17(RS3), J04, J10, J13
8. What is active transport? Give examples.	50	18	J00
9. Define 'primary active transport'. Give an example of primary active transport in the cell membrane. What is its function?	50	18	D12, D15
10. What is the function of calcium ATPase pump?	52	20	D05
11. Secondary active transport.	53	20	J06(RS2), J11(RS2), D17(RS3)
12. Explain exocytosis and endocytosis with an example for each.	54	21	D09(RS2), J17(RS3), D01, D04, D09
13. Explain the mechanism of endocytosis with an example.	54	21	D10(RS2), J10
14. Describe steps of exocytosis.	55	21	J12
15. Phagocytosis (mechanism and stages).	55	88	J07(RS2), J98, J99, J11

CHAPTER 7: MEMBRANE POTENTIAL

Short Essays

1. In a tabular column compare 'local potential' and 'action potential'.	—	44	J05(RS2)
2. Compound action potential. Give basis of its configuration.	—	149	D05(RS2), J04

Contd...

Contd...	GKPAL	AKJN	
3. Resting membrane potential and genesis (ionic basis).	61	36	D06(RS2), J07(RS2), D10(RS2), D12

Short Answers

1. Explain what is compound action potential.	—	149	J12
2. Resting membrane potential and its ionic basis.	61	36	D09(RS2), J17(RS3), J98, D06, D13

CHAPTER 8: BODY FLUIDS

Short Essays

1. Body fluid compartments.	63	28	J09(RS2), D18(RS3)
2. What is extracellular fluid volume (ECF) and how is it measured?	63	29	D08
3. Classify the fluid compartments of body giving their normal values. Mention two methods to determine ECF.	64	28, 29	J01
4. Name two principles to determine volume of body fluid compartments.	64	29	J05
5. Briefly describe a method for determination of total body water.	65	—	D05

Short Answers

1. What is the normal plasma osmolarity?	—	—	D06(RS2)
2. Classify body fluid compartments. Give their normal values.	64	28	J15(RS3), J04
3. What is the normal ICF volume and ECF volume? Mention any one method for the determination of the same.	64	28	J02
4. What is the normal value of extracellular fluid volume? Name one substance used to measure it.	65	28	J07, J14
5. Two methods of determination of ECF.	65	29	D99
6. Explain one method of determination of plasma volume in man.	65	30	D02
7. Name the constituents of ECF and ICF. List four differences between composition of intracellular and extracellular fluid.	66	28, 30	J13(RS3), D03

Contd...

Contd...

GKPAL AKJN

Section 2: BLOOD AND IMMUNITY

■ CHAPTER 9: COMPOSITION AND FUNCTIONS OF BLOOD AND PLASMA PROTEINS

Long Essays

- | | | | |
|---|----|--------|---|
| 1. Enumerate the plasma proteins along with their site of synthesis. List the important functions of plasma proteins and their normal serum levels. Define hypoproteinemia and discuss its clinical significances/add a note on albumin-globulin ratio. | 74 | 54, 56 | J08(RS2),
D09(RS2),
D10(RS2),
J17(RS3) |
| 2. Explain how plasma albumin determines fluid movement across capillaries. Name four other functions of plasma proteins. | 74 | 54, 57 | J04 |

Short Essays

- | | | | |
|---|----|--------|--|
| 1. How much is normal blood volume and how is it kept constant? | 72 | — | D08 |
| 2. Describe one method for determining blood volume. | 72 | — | D05 |
| 3. Plasma proteins—enumerate, functions. | 74 | 54, 57 | D14(RS3),
D15(RS3),
D18(RS3),
J98, D99,
D10, D16 |

Short Answers

- | | | | |
|---|----|--------|-------------------------------|
| 1. What is colloidal osmotic pressure and its significance? | — | 54 | D11(RS3) |
| 2. What is plasmapheresis? What is its importance? | — | 55 | J01, J03, D06 |
| 3. Give the value of normal blood volume in adults. Explain the principles of measurement of blood volume. | 72 | 30 | D06(RS2) |
| 4. Functions of plasma proteins. | 74 | 57 | J16(RS3),
J06, D07,
D09 |
| 5. Name three important plasma proteins. Give one important function of each. | 74 | 54 | D05(RS2) |
| 6. Name the plasma proteins. How much pressure exerted by these proteins in vascular system? What is the importance of this pressure? | 74 | 54, 57 | J08 |

Contd...

Contd...

GKPAL AKJN

- | | | | |
|---|----|----|----------|
| 7. Give the normal concentration and function of albumin. | 74 | 54 | D98, D13 |
|---|----|----|----------|

■ CHAPTER 10: BONE MARROW AND HEMOPOIESIS

None

■ CHAPTER 11: RED BLOOD CELLS

Short Essays

- | | | | |
|---|----|---|------------------|
| 1. Explain the effect of shape of RBC on osmotic fragility. Name two conditions where osmotic fragility is increased. | 87 | — | D05 |
| 2. Packed cell volume (PCV). | 88 | — | D99 |
| 3. Erythrocyte sedimentation rate (ESR). | 88 | — | J12(RS3),
J98 |

Short Answers

- | | | | |
|---|----|---|------------------------------------|
| 1. What is packed cell volume (hematocrit) and how is it determined? Give its significance. | 88 | — | D11(RS3),
J04 |
| 2. Erythrocyte sedimentation rate (normal ESR, factors influencing it and its clinical importance). | 88 | — | J07(RS2),
J01, J02, J06,
J12 |

■ CHAPTER 12: ERYTHROPOIESIS

Long Essay

- | | | | |
|---|----|----|--|
| 1. What is erythropoiesis? Name the sites of erythropoiesis in an adult. Describe the stages/process of erythropoiesis. Briefly describe the factors affecting erythropoiesis. How is this process regulated? | 90 | 69 | J06(RS2),
J14(RS3),
D18(RS3),
D98, J99,
D00, D02,
D13 |
|---|----|----|--|

Short Essays

- | | | | |
|---|----|----|---------------|
| 1. Compare the red blood cell (RBC) from patients with B ₁₂ and iron deficiency stages. | — | — | J07 |
| 2. Describe the stages of erythropoiesis with their characteristic features. Mention the sites where erythropoiesis occurs. | 90 | 70 | D99, J07, J14 |
| 3. List the changes in erythroid precursors during maturation. Explain the basis of macrocytic anemia. | 91 | 70 | J04 |
| 4. Describe the factors responsible for synthesis and maturation of red blood cells. | 93 | 70 | D09 |

Contd...

Contd...

	GKPAL	AKJN	
5. List six erythropoietic factors. Specify the effects when any two are deficient.	93	70	J05
6. Draw a flowchart to show the regulation of erythropoiesis. List four dietary substances needed for erythropoiesis.	94	70	J05(RS2)
7. Describe the effect of hypoxia and vitamin B ₁₂ deficiency on erythropoiesis and erythrocytes.	94	70, 74	D05
8. Explain why vitamin B ₁₂ deficiency causes anemia. Give the blood picture in this condition.	95	74	D06(RS2)

Short Answers

1. Enumerate the stages of erythropoiesis. Describe the fate of RBC.	91, 99	70	D07, D11
2. Describe a polychromatophilic normoblast and gives its significance.	92	70	D03
3. Four factors influencing erythropoiesis.	93	70	D99, D14
4. Erythropoietin (sources, action and regulation).	93	71	J07(RS2), J08(RS2), D03
5. Name the maturation factors in erythropoiesis.	93	72	D08
6. What are the effects of vitamin B ₁₂ and folic acid on erythropoiesis?	94	72	D10
7. Intrinsic factor of Castle—secretion and action (physiological significance).	96	72	D16(RS3), D08, D13
8. What is reticulocytes? What does reticulocytosis indicate?	97	—	J02
9. Differentiate reticulocyte from erythrocyte.	97	70	D14

CHAPTER 13: DESTRUCTION OF RED BLOOD CELLS**Short Essay**

1. Describe the fate of hemoglobin of the damaged red blood corpuscle following hemolysis.	100	62	D15(RS3), J00, J03, J06
--	-----	----	-------------------------

CHAPTER 14: HEMOGLOBIN AND BLOOD INDICES**Short Essay**

1. Describe steps in hemoglobin synthesis. Add a note on disorders of hemoglobin synthesis. Mention two types of hemoglobinopathies.	104	62	J00
--	-----	----	-----

Contd...

Contd...

Short Answers

	GKPAL	AKJN	
1. Types of hemoglobin	104	62	J18(RS3)
2. Fetal hemoglobin	104	63	J13(RS3)
3. What are the structural and functional differences between adult and fetal hemoglobin?	104	63	D00
4. Mention the functions of hemoglobin.	105	62	D08(RS2), D10(RS2), D00, J15
5. Define and give the normal values for mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC).	107	—	
6. Calculate MCV and MCH, given; packed cell volume (PCV) = 45%, RBC count = 5 million/cumm, Hb% = 15 g%.	107	—	D12(RS3)
7. Explain color index and its significance.	108	—	D10

CHAPTER 15: PATHOPHYSIOLOGY OF ANEMIA AND POLYCYTHEMIA**Long Essay**

1. What is anemia? Describe different types of anemia with their physiological causes.	109	72	J11
--	-----	----	-----

Short Essays

1. Mention the causation, morphological features of red cells and treatment of pernicious anemia.	—	74	J11(RS2)
2. Macrocytic anemia.	110	75	J15(RS3)
3. Classify anemia based on blood indices. Explain any one type of anemia.	111	74	D12

Short Answers

1. State the differences between beta thalassemia major and minor.	—	64	D09
2. B ₁₂ deficiency anemia—give two salient features.	—	-74	D14
3. List two features and treatment of macrocytic anemia.	—	74	D16
4. Define anemia and give laboratory classification of anemia with an example for each.	109	72	J06(RS2), J12(RS3)
5. Iron deficiency anemia—important features, blood indices values.	111	76	D13(RS3), D15(RS3)

Contd...

Contd...

	GKPAL	AKJN	
6. What is meant by aplastic anemia? What is its clinical importance?	111	—	D01, D04
7. Sickle cell anemia.	112	—	D18(RS3), J10

CHAPTER 16: BLOOD GROUPS AND PHYSIOLOGICAL BASIS OF BLOOD TRANSFUSION

Long Essays

1. Explain the basis for classification of blood groups. Describe the Rh blood group system with its importance. 116, 120 110 J03
2. Classify blood groups and explain how erythroblastosis fetalis takes place. 121 109, 112 J08
3. Define jaundice. Enumerate the causes of jaundice. What is hemolytic disease of the newborn? Discuss in brief. 121 79 J10(RS2)

Short Essays

1. What is the basis of classification of blood groups? Define and explain how Landsteiner's law is applicable to the blood group systems. 116, 119 109 D11(RS3)
2. Rhesus factor (Rh factor) and its significance. Add a note on erythroblastosis fetalis. 120 110 J06(RS2), D07(RS2), D14
3. What is erythroblastosis fetalis (Rh incompatibility in newborn)? Describe the manifestations. Give its basis and principle of treatment. How can it be prevented? 121 112 D12(RS3), J98, D98, D03, J10
4. What is meant by mismatched blood transfusion and explain the complications (consequences) of mismatched blood transfusion. 125 113 D06(RS2), D13(RS3), D17(RS3), J02, D02, D04, J15

Short Answers

1. Write briefly the importance of blood groups. 116 — J08
2. What is Bombay blood group? 118 — J12(RS3)
3. Name the agglutinogens and agglutinins present in blood in a person of O +ve group. What is "Bombay blood group"? 119, 118 109 J07(RS2)
4. State Landsteiner's law. Indicate to which blood group system it is not fully applicable. 119 110 D05(RS2), D09(RS2), J18(RS3), D01, D04, J11, J12, J14

Contd...

Contd...

	GKPAL	AKJN	
5. Give the agglutinin and agglutinin content of different blood groups of ABO system.	119	109	J13
6. Name the agglutinogens and agglutinins in the following blood types: (a) AB negative, (b) O positive.	119	109	D03
7. Describe erythroblastosis fetalis (hemolytic disease of new born)—prevention and treatment.	121	112	J01, D02, J11
8. Kernicterus.	121	112	D16(RS3)
9. What is neonatal jaundice? What is the role of phototherapy in its treatment?	122	80	D09
10. Define exchange transfusion. Mention two indications.	122	—	J05
11. Explain why people with 'O' blood group are called universal donors?	124	113	J10
12. Cross matching (define, types).	124	113	D15(RS3)
13. Complications (effects) of mismatched blood transfusion.	125	113	D99, D12
14. What is the mechanism of acute renal failure in mismatched blood transfusion reaction?	125	114	D16

CHAPTER 17: WHITE BLOOD CELLS

Long Essay

1. Classify the leukocytes and describe their morphological features with the help of diagrams. Elaborate the steps involved in the phagocytic function of neutrophils. 128, 136 84, 88 J11(RS2)
2. Classify leukocytes. Give an account of development (various stages of leukopoiesis) and functions of different leukocytes. 133, 128 84, 89 J18(RS3), J13

Short Essays

1. T cells versus B cells. — — J08(RS2)
2. Write a short note on functions of leukocytes. 127 85 J14
3. Macrophages—functions. 144 117 D14

Short Answers

1. Classify lymphocytes based on function and specify their roles. — 86 J05

Contd...

Contd...	GKPAL	AKJN	
2. List the functions of <u>neutrophils</u> .	136	85	D17(RS3)
3. Chemotaxis.	137	88	J15(RS3)
4. What is opsonization and its purpose? Name few opsonins.	137	88	D11(RS3)
5. Eosinophil.	139	85	J15(RS3)
6. Mention the functions of basophils.	142	86	D10
7. Monocytes—morphology and functions.	143	87	D06(RS2), J10
8. How macrophages are derived and what are their function?	144	117	D15

CHAPTER 18: THYMUS, LYMPHOID TISSUES, AND LYMPH

Short Essay

1. What is lymph? Describe the formation and circulation of lymph. What are its functions?	155	119	D11(RS3), J18(RS3), J10
--	-----	-----	-------------------------

Short Answers

1. Explain why edema occurs with blockage of lymph vessels.	—	—	D03
2. Factors affecting flow of lymph.	—	120	D06
3. Functions of lymph.	156	120	D11
4. List the functions of lymphatic circulation.	156	120	J14(RS3)

CHAPTER 19: IMMUNITY

Long Essays

1. Classify T lymphocytes. Explain the mechanism of cellular immunity.	165, 170	124, 126	J16(RS3)
2. Describe in detail the mechanism of antigen recognition and activation of specific immune response in both humoral and cell-mediated immunity. How does HIV disease compromise immunity?	170, 180	125	D15

Short Essays

1. What is immunity? Describe specific and nonspecific immunity.	—	123	D06
2. Define 'innate immunity'. Mention the factors that contribute to the same.	159	123	D13(RS3)

Contd...

Contd...	GKPAL	AKJN	
3. What is reticuloendothelial (monocyte-macrophage) system? Outline its function.	160	117	D14(RS3), D17(RS3), J02, J15
4. Macrophage system.	160	117	J13(RS3)
5. <u>T lymphocyte—functions.</u>	165	125	J09(RS2), D12(RS3), D16(RS3), D17(RS3), J07, D16
6. Cell-mediated immunity.	170	125	D05(RS2)
7. Explain the role of lymphocytes in immunity.	171	125	J00, J01, J06
8. Describe the mechanism of humoral immunity.	172	127	D07
9. Explain the role of 'B' lymphocytes in immunity.	173	125	D10
10. Describe the formation and functions of immunoglobulins.	176	128	D05

Short Answers

1. What is active and passive immunity? Give one example for each.	—	—	D00
2. What is immunity? Mention the two types of immunity.	158	123	D99
3. Reticuloendothelial system.	160	117	J08(RS2)
4. List the cells and functions of reticuloendothelial system.	160	117	D11
5. Explain acquired immunity.	164	125	D07(RS2), J14
6. <u>T-lymphocyte—types, functions.</u>	165	125	D09(RS2), J17(RS3), D03
7. Give the functions of helper T cell.	165	127	J11
8. List the functions of 'B' lymphocytes.	168	126	D14(RS3), J15
9. Plasma cells.	173	118	D05(RS2), D00, J03, D03
10. What are immunoglobulins? What are their functions.	175	128	D00, D01, D04
11. Draw a diagram showing components of immunoglobulin G (IgG) molecule.	176	128	D16
12. Autoimmune phenomenon.	179	—	J06(RS2), D06

Contd...

Contd...

CHAPTER 20: PLATELETS AND THEIR ROLE IN HEMOSTASIS

Long Essay

- | | | | |
|--|---------------|-------------|-----|
| 1. What are platelets? Describe the process of blood coagulation. Name any two anticoagulants and describe their mode of action. | 186, 200, 205 | 94, 98, 103 | D06 |
|--|---------------|-------------|-----|

Short Essays

- | | | | |
|--|-----|----|----------|
| 1. Platelets | 186 | 94 | J99 |
| 2. Describe briefly the functions of thrombocytes. | 189 | 96 | D98, D01 |
| 3. Explain the role of platelets in hemostasis. | 190 | 96 | D07(RS2) |

Short Answers

- | | | | |
|--|----------|----------|--|
| 1. What is megakaryocyte? Where it is present? Briefly write its function. | 185 | 95 | D08 |
| 2. Describe the morphology of platelets. | 186 | 94 | J12 |
| 3. Functions of platelets (thrombocytes). | 189 | 96 | D05(RS2), D09(RS2), D12(RS3), J14(RS3), J17(RS3) |
| 4. What is the normal platelet count? Give two functions of platelets. | 190 | 95 | D17(RS3) |
| 5. Explain the mechanism of platelet aggregation. | 191 | 96 | J10 |
| 6. Name two tests to assess platelet function and give normal value of each. | 194 | — | J04 |
| 7. Purpura. | 194 | 106 | D18(RS3) |
| 8. Thrombocytopenic purpura. | 194 | 106 | J10(RS2), J13(RS3), J08 |
| 9. Purpura and hemophilia. | 194, 209 | 106, 105 | D09(RS2) |

CHAPTER 21: BLOOD COAGULATION

Long Essays

- | | | | |
|---|----------|----|-----|
| 1. Define hemostasis. Describe the stages of hemostasis. Describe the mechanism of blood coagulation. | 183, 200 | 98 | D09 |
|---|----------|----|-----|

Contd...

Contd...

- | | | | |
|---|--------------------|-------------------|---|
| 2. Enumerate coagulation factors. Describe the intrinsic and extrinsic mechanism of coagulation with a neat flowchart. Add a note on anticoagulants/Add a note on hemophilia (commonly occurring bleeding disorders)/Add a note on tests for coagulation. | 196, 200, 205, 209 | 100, 98, 103, 105 | J07(RS2), D08(RS2), J12(RS3), J15(RS3), D16(RS3), J01, D04, D07 |
|---|--------------------|-------------------|---|

Short Essays

- | | | | |
|--|----------|----------|--|
| 1. Name the procoagulants and explain how these hasten the coagulation process. | — | — | J09 |
| 2. Temporary hemostasis. | 184 | 98 | J14(RS3) |
| 3. Name the clotting factors and add a note on purpura. | 196, 194 | 100, 106 | D11 |
| 4. Intrinsic mechanism of blood coagulation. | 200 | 101 | D10(RS2), D14(RS3), J18(RS3), J12, D13 |
| 5. Draw a schematic diagram to show the steps in the intrinsic pathway of blood clotting. Name the mechanisms that initiate this pathway in vivo and in vitro. | 200 | 101 | D03 |
| 6. Describe the extrinsic pathway of clotting. | 201 | 101 | J13 |
| 7. Describe the process and significance of clot retraction. | 202 | 100 | J07 |
| 8. Give a note on fibrinolytic system. | 202 | 103 | D10 |
| 9. Describe the naturally occurring mechanisms which normally prevent clotting. | 203 | 98 | J05(RS2) |
| 10. Mechanism of fibrinolysis. | 203 | 103 | J16(RS3) |
| 11. Describe the factors maintaining fluidity of blood in the intact vascular system and the factors favoring tendency for clot formation. | 205 | 102 | D15 |
| 12. Anticoagulants and their mode of action. | 205 | 103 | D05(RS2), D09(RS2), J99, D01, J15 |
| 13. What is the normal bleeding time? Name one condition where it is prolonged. | 208 | — | J14 |
| 14. Give a brief account of hemophilia. | 209 | 105 | J00, D00, J02, J14 |

Short Answers

- | | | | |
|--|---|-----|----------|
| 1. Vitamin K. | — | 105 | D08(RS2) |
| 2. Why is blood clotting abnormal in patients with vitamin K deficiency? | — | 105 | D07(RS2) |

Contd...

Contd...	GKPAL	AKJN	
3. What is the effect of vitamin K deficiency on coagulation?	—	105	D15
4. List two causes of increased bleeding time.	—	—	D14
5. List the natural mechanisms responsible for arrest of bleeding from small blood vessels.	183	98	J05
6. Coagulation factors.	196	100	J10(RS2)
7. Mention the role of factor VII and factor XIII in clotting mechanism. What is hemophilia?	198	100	D12
8. Draw a flowchart showing extrinsic mechanism of clot formation.	200	101	D16
9. Plasmin.	203	103	J98
10. Mention any four factors that prevent coagulation of blood inside the blood vessels.	203	102	J03
11. What are anticoagulants? Give examples.	205	103	D13
12. Name two anticoagulants with their mechanism of action.	205	103	D13(RS3), D14(RS3)
13. Heparin and two actions of heparin as anticoagulant.	206	103	J06
14. Explain how: (a) Dicoumarol and, (b) EDTA prevent blood clotting.	206	104	D02
15. Name two anticoagulants used in the laboratory and explain the mechanism of action of any one.	206	—	J04
16. How does heparin act as an anti-coagulant?	207	103	D15
17. What is prothrombin time? Explain its usefulness as a hemostatic test.	208	—	D06(RS2)
18. Name two bleeding disorders. What is von Willebrand's factor?	209	104	D07(RS2)
19. Classify hemophilia and its causes of each	209	105	J08
20. Describe classical hemophilia.	209	105	J99, D07, J10, J15

Section 3: NERVE AND MUSCLE

CHAPTER 22: STRUCTURE AND FUNCTIONS OF NEURONS

Short Essay

1. Myelinogenesis.	217	139	J10(RS2)
--------------------	-----	-----	----------

Contd...

Contd...

Short Answers

1. Give a note on myelinogenesis.	217	139	D10
2. Myelination and its physiological significance.	218	139	J05, J15

CHAPTER 23: NERVE POTENTIALS

Short Essays

1. Explain the response of a neuron to the application of a threshold stimulus.	—	—	J12
2. Define chronaxie, rheobase and utilization time. Draw a strength duration curve.	227	40	J02, J03, D04
3. Explain the strength duration curve.	227	41	D14
4. Action potential in the nerve—describe with a diagram, electrical changes and ionic basis of different phases, properties.	228	38	D08(RS2); D17(RS3); D02, J06, D06, D14 D15
5. Draw a sketch of nerve action potential, label its components and explain their causation.	228	38	
6. Draw and label a nerve action potential. Explain propagation of action potential along an unmyelinated axon.	228, 233	39	J13, D16
7. Refractory period.	232	42	J10(RS2)
8. Describe the transmission of impulse in myelinated and nonmyelinated nerve fibers (propagation of nerve impulse).	233	146	D98, J09, D13
9. Describe the transmission of impulses in myelinated nerve fibers (saltatory conduction).	234	146	D14(RS3), D98

Short Answers

1. List four factors that influence conduction in nerve fibers.	—	—	J04
2. What is Quantal summation? Basis of quantal summation.	—	—	D15(RS3), J04
3. What are the characteristics of catelectrotonus?	—	43	J05
4. List the properties of graded potential.	226	43	D16
5. Define the terms chronaxie, rheobase and utilization time.	227	41	D08(RS2), J17(RS3), J00, D00, J07, D07, J09, D15
6. Strength—duration curve.	227	41	J09(RS2), J08

Contd...

Contd...	GKPAL	AKJN
7. Draw a labeled diagram of monophasic nerve action potential in a neuron.	228	39 D99, D08
8. Explain the mechanism of action of local anesthetics.	231	— D06(RS2)
9. Explain the role of ionic calcium in nerve excitability.	231	145 J05(RS2)
10. Refractory period—define, cause, types and their role.	232	42 D03, D11
11. Define refractory period of an excitable tissue. Explain how it differs in cardiac and skeletal muscles, what is its significance.	232	42, 164 J03, J10
12. Absolute refractory period—ionic basis and significance.	232	42 J05(RS2), D12(RS3)
13. Describe saltatory conduction. What is its importance? What are its advantages?	234	146 J09(RS2), J18(RS3), D18(RS3), J98, J01, J02, J03, D14
14. Differentiate between local potential and action potential.	234	44 J03, D15

■ CHAPTER 24: PROPERTIES, CLASSIFICATION AND APPLIED ASPECTS OF NERVE FIBERS

Short Essays

1. Classify nerve fibers based on velocity and diameter (Gasser and Erlanger's classification). Mention the factors influencing conduction of velocity of nerve impulse.	237	148 J00, D01, D03, D09, J14
2. Explain changes during Wallerian degeneration and regeneration of injured nerve fibers.	238	152 D10(RS2), J11(RS2)

Short Answers

1. Write the two/three differences between A and C type of nerve fiber.	—	149 J16(RS3), J15
2. Properties (electrical) and functions of nerve fibers.	236	145 J06, J07
3. Classify nerve fibers (Erlanger and Gasser classification).	237	148 J07(RS2), J06
4. Which are the large diameter myelinated nerve fibers according to Erlanger and Gasser's classification? Describe the mode of transmission of impulse in myelinated nerves.	237, 234	149 D11(RS3)

Contd...

Contd...	GKPAL	AKJN
5. Distal changes in the axon following nerve injury (Wallerian degeneration).	238	152 D07(RS2), D15(RS3), D16(RS3), D99
6. What is 'chromatolysis'? When does it occur?	239	152 J13

■ CHAPTER 25: NEUROMUSCULAR TRANSMISSION

Long Essay

1. Define myoneural (neuromuscular) junction. Describe the structure of neuromuscular junction and the mechanism of transmission of impulse across neuromuscular junction of skeletal muscle with the help of a diagram. Write about the factors affecting transmission at myoneural junction.	241	157 J10(RS2), J11(RS2), J12(RS3), D16(RS3), J11
--	-----	---

Short Essays

1. Neuromuscular junction.	241	157 J18(RS3), J99
2. Outline the sequence of events during transmission of an impulse across the myoneural junction in skeletal muscle. Name one blocker of this junction and give its mechanism of action.	242	158 J05(RS2), J15(RS3), J16(RS3), D99, J02, J04, D04, D10
3. Neuromuscular blocking agents (classify and explain mechanism of actions).	244	159 D08(RS2), J17(RS3), D18(RS3), J98, J10
4. What is myasthenia gravis? What are its causes and clinical features? Explain the physiological basis of its treatment.	245	160 J06(RS2), D12(RS3), J00, D02, J05, J12

Short Answers

1. Mention neurotransmitter released and the disease that occurs at neuromuscular junction.	243	158, 160 J06(RS2)
2. Write steps showing fate of acetyl choline at neuromuscular junction.	243	158 J14(RS3)
3. Explain what is end-plate potential.	244	158 J09
4. Neuromuscular blocking agents—classify with one example each, clinical uses.	244	159 D03, D12
5. What is the mechanism of action of botulinum toxin?	244	159 D05

Contd...

Contd...

	GKPAL	AKJN	
6. Explain the mechanism of action of curare.	245	160	D05(RS2)
7. Name two anticholinesterase drugs acting at neuromuscular junction.	245	160	D15
8. Describe the mechanism of action of a nondepolarizing neuromuscular blocker.	245	—	D05
9. Myasthenia gravis (cause and the physiological basis of cure).	245	160	J98, J99, D01, D04, J08, D13, D14
10. Briefly explain denervation super-/hyper sensitivity.	247	194	D14(RS3), D16(RS3), J05

■ CHAPTER 26: STRUCTURE OF SKELETAL MUSCLE: PHYSIOLOGICAL ASPECTS

Short Essays

1. Draw diagrams to compare the sarcomere at rest and during contraction. 254 165 D05(RS2)
2. Describe the organization and function of sarcotubular system in the skeletal muscle. 254 166 D11(RS3), D14(RS3)

Short Answers

1. Explain what is 'relaxing proteins' in skeletal muscle. — 166 J12
2. Compare the role of troponin and calmodulin. — — D06(RS2)
3. Muscle proteins and their functions. 251 166 D10(RS2), D00, J07
4. Name the contractile proteins present in the muscle. 251 166 J10
5. Troponin. 252 166 J99
6. Sarcomere (draw in relaxed and contracted state). 253 164 J06(RS2), J11(RS2), J15(RS3), J98, D00, J01, D01, J04, D04, J08, D11
7. Mention the components and functions of sarcotubular system in skeletal muscle (draw a labeled diagram). 254 166 J01, J13, D16
8. Write about storage, release, functions and reuptake of ionic calcium in skeletal muscle. 255 166 J16(RS3)

Contd...

Contd...

GKPAL AKJN

■ CHAPTER 27: MECHANISM OF SKELETAL MUSCLE CONTRACTION

Long Essays

1. Describe the structure of a skeletal muscle. Explain the molecular basis of skeletal muscle contraction. 249, 258 162, 168 D10
2. What is a sarcomere? Describe the molecular basis of muscular contraction (excitation contraction coupling) in skeletal muscle. Add a note on myasthenia gravis. 253, 258, 245 164, 168, 160
3. Describe the molecular basis of skeletal muscle contraction. Add a note on isometric contraction. 258 168 J14(RS3)
4. Describe the excitation-contraction coupling in skeletal muscle. What is the phenomenon of muscle fatigue? 258, 270 168 J07(RS2)
5. Describe the molecular basis of muscular contraction in skeletal muscle. Add a note on features seen in fatigue of a muscle. 258, 270 168 J15

Short Essays

1. Electromyogram. — 45 D10(RS2)
2. Describe the sarcotubular system. Explain the excitation contraction coupling the skeletal muscle. 254, 258 166 D06
3. Explain the (sliding filament) mechanism of muscle contraction. 258 168 D15(RS3), J13
4. Explain excitation-contraction coupling reaction with help of a diagram. 258 168 D09(RS2), J18(RS3), J99, D01, J03, D11
5. Role of calcium in muscle contraction. 259 168 D08(RS2), J15(RS3)
6. Walk along mechanism for contraction of muscle (molecular basis of muscle contraction). 259 168 D07(RS2), J08(RS2), J01, J10, D16
7. Isotonic and isometric contraction in skeletal muscle—define, describe the differences giving examples for each. 264 170 J17(RS3), D05, D12
8. Explain two different ways by which force of contraction of skeletal muscle is increased in the body. 264 — D03

Short Answers

1. Explain electromyography and its clinical importance. — 45 J09

Contd...

Contd...	GKPAL	AKJN	
2. Electromyogram (EMG).	—	45	D12(RS3), D17(RS3)
3. What are fibrillations and fasciculations? How are these recorded?	—	—	D07
4. What is isometric and isotonic contraction? Differentiate isometric and isotonic muscle contraction with one example for each.	264	170	D00, J02, J03, D08, D11, D14

■ CHAPTER 28: SKELETAL MUSCLE: PROPERTIES, FIBER TYPES, AND APPLIED ASPECTS

Short Essays

1. Explain the refractory periods in skeletal muscle.	—	42	D07
2. Explain <u>temporal</u> and <u>spatial summation</u> in muscle.	—	—	J05(RS2)
3. Enumerate the properties of skeletal muscle. Explain the property of fatigue in detail and factors affecting it.	266, 270	—	D11
4. Explain the length tension relationship in skeletal muscle.	268	171	D06(RS2)
5. Fatigue—define, sites, causes and effects of muscle fatigue, factors affecting. What is contraction remainder or physiological contracture? Why does the cardiac muscle not become fatigued?	270	—	D11(RS3), J08
6. Differentiate between red and white muscles.	271	174	D11
7. What is motor unit and how it is formed?	272	173	J11

Short Answers

1. Refractory period in skeletal muscle.	—	42	D18(RS3)
2. What are the functions of ATP in skeletal muscle contraction?	270	175	D09, J14
3. List four differences between type I and type II muscle fibers.	271	174	D16
4. Explain the causes of heat rigor and rigor mortis.	271	176	D09, J14
5. What is rigor mortis? Explain the mechanism of rigor mortis. What is its medicolegal importance?	271	176	D98, J01, D02, D03, J10, J12

Contd...

Contd...

	GKPAL	AKJN	
6. Motor unit—define, significance (of such arrangement in skeletal muscle), recruitment.	272	173	J05(RS2), D11(RS3), D14(RS3), J17(RS3), D98, D00, J07, D14, J15 D16
7. Explain how asynchronous discharge of motor units is helpful.	273	174	

■ CHAPTER 29: SMOOTH MUSCLE AND CARDIAC MUSCLE

Short Essays

1. Describe the differences between the two types of smooth muscle.	276	191	J05
2. Describe the mechanism of smooth muscle contraction (excitation-contraction coupling in visceral smooth muscle).	279	192	D08, J09
3. Name the properties of smooth muscle. How do you explain the semi rhythmicity in smooth muscle?	280	191	D07
4. Functional properties of smooth muscle.	280	192	D15(RS3)
5. In a tabular form, give the differences between skeletal, cardiac and smooth muscle.	283	197	D05
6. Compare and contrast skeletal muscle with cardiac muscle (two functional differences).	283	197	J16(RS3), D13
7. Five differences between smooth muscle and cardiac muscle.	283	197	J06(RS2), J15(RS3)

Short Answers

1. Name the two major types of smooth muscles. Give any two differences between them.	276	191	J13
2. Enumerate the properties of (visceral) smooth muscle.	280	191	D05(RS2), D99, D08
3. Functions of smooth muscle.	281	192	D18(RS3)
4. Differences between skeletal muscle and smooth muscle.	283	197	D17(RS3)

Section 4: AUTONOMIC NERVOUS SYSTEM

■ CHAPTER 30: FUNCTIONAL ORGANIZATION OF AUTONOMIC NERVOUS SYSTEM

Short Essay

1. Cholinergic sympathetic fibers.	288	924	D10(RS2)
------------------------------------	-----	-----	----------

Contd...

Contd...

GKPAL AKJN

CHAPTER 31: SYMPATHETIC SYSTEM

Short Essay

- | | | | |
|--|-----|-----|----------|
| 1. Enumerate effects of sympathetic stimulation. | 299 | 930 | J14(RS3) |
|--|-----|-----|----------|

Short Answer

- | | | | |
|---|-----|-----|-----|
| 1. Compare the effects of sympathetic and parasympathetic stimulation on pupil. | 299 | 930 | J15 |
|---|-----|-----|-----|

CHAPTER 32: PARASYMPATHETIC SYSTEM

Short Essay

- | | | | |
|---|-----|-----|-----|
| 1. Describe the effects of parasympathetic stimulation on cardiac and smooth muscles. | 304 | 930 | J10 |
|---|-----|-----|-----|

CHAPTER 33: CONTROL OF AUTONOMIC FUNCTIONS AND APPLIED ASPECTS

None

CHAPTER 34: AUTONOMIC FUNCTION TESTS

None

CHAPTER 35: HEART RATE VARIABILITY

None

Section 5: GASTROINTESTINAL SYSTEM

CHAPTER 36: FUNCTIONAL ORGANIZATION OF GASTROINTESTINAL SYSTEM AND PRINCIPLES OF GASTROINTESTINAL REGULATIONS

Short Essays

- | | | | |
|--|-----|-----|----------|
| 1. Outline the role of mucus in different parts of gastrointestinal tract. | — | — | D03 |
| 2. Draw a cross section of the small intestine to show the various layers. State the role of enteric nervous system. | 329 | 202 | J05(RS2) |
| 3. Name the components of the enteric nervous system and outline role of enteric nervous system in the gut. | 331 | 202 | J04 |

Short Answers

- | | | | |
|--|-----|-----|----------|
| 1. Enteric nervous system. | 331 | 202 | J15(RS3) |
| 2. Describe myenteric and Meissner's plexus of enteric nervous system. | 331 | 202 | D09 |

CHAPTER 37: GASTROINTESTINAL HORMONES

Long Essay

- | | | | |
|---|-----|-----|----------|
| 1. Give an account of gastrointestinal hormones with reference to site of production, regulation of secretion and function. | 335 | 276 | D08(RS2) |
|---|-----|-----|----------|

Contd...

Contd...

GKPAL AKJN

Short Essays

- | | | | |
|--|-----|----------|--------------------|
| 1. How is Gastrin liberated? What are its functions? Name factors that increase and inhibit its secretion. | 335 | 224 | J15(RS3), D03, J04 |
| 2. Name the gastrointestinal hormones. Describe the functions of cholecystokinin. | 337 | 276, 236 | D10 |
| 3. Cholecystokinin—pancreozymin. | 336 | 236 | D05(RS2), D15(RS3) |

Short Answers

- | | | | |
|---|-----|-----|--|
| 1. Explain 'trophic' action of a gastrointestinal hormone. | — | — | J05 |
| 2. Enumerate the different gastrointestinal hormones. List their functions. | — | 276 | D99, D00, J03, D05, J06, D06 |
| 3. Gastrin (source, action, stimulants and inhibitors). | 335 | 224 | J07(RS2), J16(RS3), J99, J05, D13 |
| 4. Secretin (source, action and stimulants). | 337 | 236 | D06(RS2), D13(RS3), J98, D98, J13, D16 |
| 5. Explain the role of secretin in regulation of bile secretion. | 337 | 245 | J11 |
| 6. Cholecystokinin/CCK-PZ (source, action and stimulants). | 336 | 236 | J12(RS3), J99, D14 |

CHAPTER 38: PRINCIPLES OF GASTROINTESTINAL SECRETION AND SECRETION OF SALIVA

Long Essay

- | | | | |
|---|-----|-----|-----|
| 1. Describe the composition, functions and regulation of secretion of saliva. | 345 | 208 | J12 |
|---|-----|-----|-----|

Short Essays

- | | | | |
|---|-----|-----|---|
| 1. Explain the mechanism of salivary secretion and its regulation. | — | 209 | D13(RS3), D14(RS3), D02, D04, D05, D14, D16 |
| 2. Draw a diagram to show the pathway for salivary secretion when food is placed in the mouth (reflex salivation). Name four other stimuli that cause salivary secretion. | — | — | J05(RS2), D03 |
| 3. Saliva (composition and function and regulation). | 345 | 208 | D05(RS2), D09(RS2), J17(RS3), D12, J14 |

Contd...

Contd...	GKPAL	AKJN	
4. Explain the conditioned and unconditioned reflexes which increase salivary juice secretion.	347	—	J08
Short Answers			
1. Saliva (components)—functions.	345	209	J10(RS2), D15(RS3), D17(RS3), J18(RS3), D98, J01, J02, D06, J13
2. Describe regulation of salivary secretion.	346	210	D07
3. What is conditioned salivary secretion?	347	—	J15(RS3)
CHAPTER 39: GASTRIC SECRETION			
Long Essay			
1. Describe the composition and functions of gastric juice. Describe various phases and regulation of gastric secretion with suitable experimental evidences.	350	221	J01, D01, D04, D07, J10, J15
Short Essays			
1. What is achlorhydria? What complications does it lead to?	—	75	J08
2. Functions of stomach.	348	221	J07(RS2), D09(RS2), J17(RS3)
3. Functions of gastric juice secretion.	351	221	D17(RS3)
4. HCl acid secretion—mechanism with help of a diagram, regulation.	351	222	J12(RS3), D13(RS3), J14(RS3), J98, J99, J00, J03, D05, J11
5. Regulation of gastric secretion.	354	223	J06(RS2), J07, J13
6. Explain the gastric phase of gastric juice secretion (experimental evidence).	354	224	D06(RS2), J14, D16
7. Pavlov's pouch.	355	1039	D11
8. Peptic ulcer—etiology, pathophysiology and treatment (physiological basis, mechanism of action of drugs used).	358	228	D05(RS2), D16(RS3), D09, D10, J12
Short Answers			
1. Gastric mucosal barrier.	—	219	D06
2. Explain functions of gastric mucosa	—	219	D07
3. Name the different cell types of gastric mucosa. Mention the functions of each of them.	350	219	J02

Contd...

Contd...	GKPAL	AKJN	
4. Enumerate the functions of parietal cells.	350	219	D98
5. Composition and function of gastric juice.	350	221	D11
6. Explain how gastrin acts on gastric juice secretion.	352	224	D10
7. What is the effect of vagotomy on stomach?	354	—	D05
8. What is the effect of sympathetic stimulation on stomach?	354	—	D05, J07
9. Explain the role of vagal stimulation of gastric juice secretion.	354	223	J10
10. Explain sham feeding.	354	224	J01, J02
11. Gastric phase of gastric secretion.	354	224	J10(RS2)
12. What is 'peptic ulcer'? Mention two causes for it.	358	228	D15
13. Physiological basis of treatment of hyperacidity.	359	—	J10(RS2)
14. Describe how gastric acid secretion can be reduced to treat acid peptic ulcer.	359	—	J11(RS2)
15. List the effects of gastrectomy.	360	228	D12
16. What are the sequelae after partial gastrectomy?	360	—	J09(RS2)
CHAPTER 40: PANCREATIC SECRETION			
Long Essay			
1. Describe the composition, functions and regulation of secretion of pancreatic juice.	363	234	J00, D00
Short Essays			
1. Exocrine secretion of pancreas (pancreatic juice)—composition, mechanism, function (digestive), hormonal regulation of secretion.	363	234	J09(RS2), J12(RS3), D12(RS3), J13(RS3), J98, J02, D02, D04, D08, D09, J11, J12, D13, D14, D15
2. Proteolytic enzymes of pancreas.	364	235	J07(RS2), D11
Short Answers			
1. Exocrine functions of pancreas.	362	234	D10(RS2)

Contd...

Contd...	GKPAL	AKJN	
2. Pancreatic proteolytic enzymes—actions.	364	235	J99, D08, J14
3. Describe the actions of secretin and CCK-PZ on pancreatic secretion.	366	236	D09
4. Enumerate pancreatic function tests.	368	237	D06

CHAPTER 41: PHYSIOLOGY OF LIVER, LIVER FUNCTION TESTS, AND PATHOPHYSIOLOGY OF JAUNDICE

Long Essay

1. Differentiate between hemolytic and obstructive jaundice on the basis of relevant laboratory tests. Explain the differences in the results.

81 J05

Short Essays

1. Outline the formation, transport and excretion of bilirubin (bilirubin metabolism).
2. What are the types of jaundice, their salient features and method of differentiation.
3. In a tabular column compare the urine tests used to differentiate pre- and post-hepatic jaundice. Explain the basis of their difference.

63, 79 J13(RS3)

81 J11(RS2), D16(RS3)

81 J05(RS2)

Short Answers

1. List the functions of liver.
2. Enumerate liver function tests.
3. Bilirubin—source/mechanism of excretion.
4. Jaundice (classify and one cause for each type).
5. Obstructive jaundice (blood changes).
6. Mention any two differences between obstructive and hemolytic jaundice giving the basis for the difference.
7. State the differences between pre-hepatic and post-hepatic jaundice.

372 242 J05(RS2), D98, D99, J01, JQ2, D02, D06

373 — J12

374 63, 79 D06, D12

374 80 J98, D08

375 81 J06, J13

376 81 D98

376 81 D13

Contd...

Contd...

CHAPTER 42: BILIARY SECRETION

Short Essays

1. Bile—components, functions, regulation of secretion. Name the effects of bile duct obstruction.
2. Explain the enterohepatic circulation. Give its importance.
3. What are the functions of bile? Explain the enterohepatic circulation of bile salts and its importance.

378

241

J06(RS2), J07(RS2), D15(RS3), J18(RS3), D03, D07, J15 J12(RS3)

379

244

D07(RS2), D10(RS2), D02, D04, D14

382, 379

245

Short Answers

1. Composition of bile.
2. Compare hepatic and gallbladder bile.
3. Bile salts (name and functions).
4. Enterohepatic circulation (of bile salts) and its functional importance.
5. Describe the functions of gallbladder.
6. List the effects of cholecystectomy.
7. List the function of bile.
8. Cholorectic and cholagogues.
9. Which substances are called cholagogues and what is their importance?

378

241

379

246

379

243

379

244

381

245

382

246

382

245

382

245

382

245

382

245

382

245

J06(RS2), J07(RS2), D15(RS3), J18(RS3), D03, D07, J15 J12(RS3)

J15(RS3), J00, J05, J99, D99, J04, D08, D11, D15, D16

D05(RS2), D13(RS3), J16(RS3), D00, D01, J02, J03, D04

J13(RS3), D09, J11

J05(RS2), J14(RS3), J00, D00, D01, D04, J07, D13, J14

D07(RS2), J10

D08

CHAPTER 43: INTESTINAL SECRETION

Short Essays

1. Succus entericus—composition and functions.

386

249

D99, D11

Contd...

Contd...	GKPAL	AKJN	
2. Name the enzymes of succus entericus and their actions.	386	249	D11(RS3)
Short Answers			
1. Succus entericus.	386	249	J99
2. List enzymes produced by intestinal mucosa.	386	249	J04
CHAPTER 44: SECRETION OF LARGE INTESTINE			
Short Essays			
1. Functions of large intestine.	—	—	D06(RS2), D14(RS3), D99, J15
2. Name the bacteria in intestine. In which segment of gastrointestinal tract it is located? How does it help man?	390, 387	—	J09
Short Answer			
1. Explain the functions of colon (large intestine).	—	—	J16(RS3), J00, J01, D07, J12, J13
CHAPTER 45: INTRODUCTION TO GASTROINTESTINAL MOTILITY			
Long Essay			
1. Explain the types of movements in different parts of gastrointestinal tract.	395	214, 226, 251, 256	J13(RS3)
Short Answers			
1. What is migratory motor complex?	396	227	J09(RS2)
2. Explain the genesis of peristalsis in small intestine.	396	252	D06(RS2)
3. Describe the initiation, progress and purpose of peristalsis in small intestine.	396	252	D11(RS3), D16(RS3)
CHAPTER 46: CHEWING AND DEGLUTITION			
Short Essays			
1. Deglutition reflex.	—	215	D06(RS2), J99
2. Define <u>deglutition</u> . Describe the stages and mechanism of deglutition with their regulation.	398	214	J06(RS2), D16(RS3), D18(RS3), D06, D07

Contd...

Contd...	GKPAL	AKJN	
3. Name the phases of deglutition. Explain the pharyngeal (second) phase of deglutition. Add a note on achalasia cardia.	399	214	J09(RS2), D09(RS2), J11(RS2), J14(RS3), D14(RS3), D15(RS3), J17(RS3), D98, D00, J03, D12, J13 D11(RS3)
<i>deglutition</i>			
4. Describe the esophageal phase of deglutition. What is achalasia cardia and its effect.	399	215	
Short Answers			
1. Centers of deglutition.	—	215	J06
2. <u>Deglutition</u> (swallowing).	398	214	D08(RS2), J98, J07
3. Write briefly on pharyngeal phase of deglutition.	399	215	D08
4. Enumerate four changes occurring during second stage of deglutition.	399	215	D14
CHAPTER 47: ESOPHAGEAL MOTILITY			
Short Essay			
1. Achalasia cardia.	402	216	J06
Short Answers			
1. Role of lower esophageal sphincter.	402	215	J05
2. What is achalasia cardia (gastric)? What is it due to?	402	216	J10(RS2), J12(RS3), J04, J08, D08, D13, J15
CHAPTER 48: GASTRIC MOTILITY			
Short Essays			
1. Describe the movements of the stomach.	406	226	J06
2. What is gastric emptying time? Explain the factors which influence it.	408	226	J11(RS2), D99, J02, J05, J11, D13
3. Describe the causes and events in vomiting (<u>emesis</u>).	409	229	D11(RS3)
Short Answers			
1. What are the movements of stomach?	406	226	D11

Contd...

Contd...	GKPAL	AKJN	
2. Receptive relaxation—define, role in stomach.	406	226	J16(RS3), J04
3. What is the effect of composition of chyme on gastric motility?	409	227	D05
4. What is the effect of fatty meals on stomach?	409	227	J07
CHAPTER 49: SMALL INTESTINAL MOTILITY			
Short Essays			
1. Describe the different types of movements of small intestine.	413	251	D07(RS2), J16(RS3), D98, D01, J14, D16
2. Intestinal movements and slow wave.	413	251	J08(RS2)
Short Answers			
1. What are pendular movements? In which condition does it take place?	—	251	D07
2. What is myenteric reflex? What is its importance?	—	252	D02
3. Types of intestinal motility.	413	251	D05(RS2)
4. Small intestinal movements.	413	251	J98, D11, J14
5. What is the importance of segmentation peristalsis in small intestine?	413	251	D08
6. Explain enterogastric reflex and its significance.	415	227	D11(RS3), D05, J10
7. What is paralytic ileus? What is its cause?	415	253	D09
CHAPTER 50: MOTILITY OF LARGE INTESTINE			
Short Essays			
1. Describe the type of movements of large intestine and their functions.	417	256	J03, J10, D15
2. Mass peristalsis.	417	256	J18(RS3), D08
3. Explain the mechanism of defecation in an adult (defecation reflex in large intestine).	418	258	D12(RS3), J05, J08
Short Answers			
1. What is 'mass peristalsis'? What is its cause?	417	256	D13
2. What is gastrocolic reflex?	417	256	J07
3. Briefly describe the process of defecation (defecation reflex).	418	258	D10(RS2), D05

Contd...

Contd...	GKPAL	AKJN	
4. What is Hirschsprung disease?	419	257	J14(RS3)
5. What is megacolon and what are the causes and complications of this disease?	419	257	D07(RS2), J08, J09
CHAPTER 51: PRINCIPLES OF DIGESTION AND ABSORPTION			
Long Essay			
1. Describe in detail the digestion and absorption of fats. Add a note on steatorrhea.	423	266, 238	D17(RS3)
Short Essays			
1. Describe the digestion and absorption of carbohydrates.	421	263	D12(RS3)
2. Describe process of digestion and absorption of proteins in GIT.	422	268	D10
3. Explain the digestion and absorption of dietary fat.	423	266	D16(RS3), J18(RS3), D12, D15
Short Answers			
1. Name two substances absorbed mainly in lower small intestine. Give the role of any one.	—	—	J04
2. What are chylomicrons? How and where chylomicrons are formed and their functions?	—	267	D17(RS3), D08, D15
3. Give the site of absorption of: (a) Vitamin B ₁₂ and (b) Iron in the gut.	—	271	J13
4. What is 'steatorrhea'? Mention any one cause for it. Give its physiological basis.	423	238	D12(RS3), D10, D12, J13
5. What are micelles and how are they formed? What are its functions?	423	266	J11(RS2), D14(RS2)
6. Name the enzymes that help in triglyceride digestion.	423	266	J05
7. Enumerate the enzymes causing protein digestion.	423	268	J12
8. Name the important proteolytic enzymes and their mode of activation.	423	268	J11(RS2)
Section 6: ENDOCRINE PHYSIOLOGY			
CHAPTER 52: INTRODUCTION TO ENDOCRINOLOGY			
Short Essay			
1. Describe the neuroendocrine inter-relationships.	436	—	J06

Contd...

Contd...

GKPAL AKJN

Short Answers

- | | | | |
|---|-----|-----|----------|
| 1. Define hormone. Explain characteristics of a hormone. | 431 | 657 | D09, J14 |
| 2. With an example, explain paracrine signaling of hormone. | 436 | — | D14 |

CHAPTER 53: MECHANISMS OF HORMONE ACTION**Long Essay**

- | | | | |
|---|-----|-----|----------|
| 1. With the help of suitable diagrams, describe the mechanisms of action of hormones through different system of second messengers. | 445 | 661 | D07(RS2) |
|---|-----|-----|----------|

Short Essays

- | | | | |
|--|-----|-----|----------|
| 1. Explain the sequence of events involved in target cell response to hormonal action. | — | 661 | D11(RS3) |
| 2. Cellular mechanism of action of peptide hormones. | — | 661 | D12(RS3) |
| 3. Explain the mechanism of action of steroid hormones. | 448 | 662 | J12 |

Short Answers

- | | | | |
|---|-----|-----|---------------|
| 1. Explain the importance of knowing the chemical nature of a hormone to a clinician. | — | — | D13 |
| 2. Mechanism of actions of polypeptide hormones. | — | 661 | D06 |
| 3. Role of cyclic GMP as a second messenger. | 448 | 24 | D08(RS2) |
| 4. Explain the mechanism of action of steroid hormone on their target cells. | 448 | 662 | D01, D04, J08 |
| 5. Calmodulin. | 449 | 23 | J98 |

CHAPTER 54: HYPOTHALAMUS AND HYPOTHALAMO-PITUITARY AXIS**Short Essay**

- | | | | |
|---|-----|-----|---------------|
| 1. Hypothalamo-hypophyseal axis and its role in the regulation of anterior pituitary secretion. | 456 | 668 | J06(RS2), J01 |
|---|-----|-----|---------------|

Short Answer

- | | | | |
|---|-----|------|-----|
| 1. Inhibitory hormones of hypothalamus and their functions. | 456 | 1008 | J07 |
|---|-----|------|-----|

Contd...

Contd...

GKPAL AKJN

CHAPTER 55: PITUITARY GLAND: THE ANTERIOR PITUITARY**Long Essay**

- | | | | |
|---|---------------|---------------|--|
| 1. Name the cells in the anterior pituitary gland and anterior pituitary hormones. Describe the mechanisms of action and regulation of growth hormone. Describe the functions of growth hormone and also the effects of abnormal secretion of growth hormone in children and adults (gigantism/acromegaly). | 460, 462, 466 | 668, 670, 672 | D08(RS2), D11(RS3), D14(RS3), D98, J00, J03, J05, D07, D10 |
|---|---------------|---------------|--|

Short Essays

- | | | | |
|--|-----|-----|------------------------------|
| 1. What are the effects of hypophysectomy? | — | 683 | D09(RS2), J13(RS3), D06(RS2) |
| 2. List four factors that inhibit growth hormone secretion. Name other hormones regulating growth. | 462 | 670 | D06(RS2) |
| 3. Functions of growth hormone. | 464 | 670 | J17(RS3) |
| 4. Disorders of growth hormone secretion. | 466 | 672 | D12(RS3) |
| 5. Acromegaly. | 466 | 673 | J11(RS2), D16(RS3), J99, J07 |
| 6. Describe the effects of hypersecretion of growth hormone. | 467 | 672 | J09 |
| 7. Dwarfism. | 467 | 674 | D16(RS3) |
| 8. What are the physiological effects of prolactin? | 469 | 679 | J05 |
| 9. Describe the actions of TSH. How its secretion is regulated? | 470 | 692 | D03 |
| 10. List the gonadotropic hormones and their sources. Give their role in females. | 473 | 782 | D03 |
| 11. Give the source, target organs and actions of 'follicle stimulating hormone' (TSH). | 473 | 782 | D17(RS3) |

Short Answers

- | | | | |
|---|-----|-----|-----------------------------------|
| 1. What are somatomedins? What are their actions? | 466 | 670 | J06(RS2), D00 |
| 2. Acromegaly (mechanism and clinical features with basis). | 466 | 673 | J10(RS2), D13(RS3), J01, D03, D08 |
| 3. Gigantism | 466 | 672 | D18(RS3) |

Contd...

Contd...

	GKPAL	AKJN	
4. Dwarfism (pituitary dwarf).	467	674	D17(RS3), D14
5. Functions of prolactin.	469	679	D08(RS2), D16
6. What are the effects of prolactin on breast development?	469	679	
7. Schematic diagram showing regulation of thyroid hormones.	470	693	J08(RS2)
8. List the functions of TSH.	471	692	D16
9. Gonadotropins—define and name them, gonadotropins. Give the sources, target organs and actions.	473	782	D05(RS2), J04, J10, D13

CHAPTER 56: POSTERIOR PITUITARY

Long Essays

1. Describe the synthesis, transport, storage and functions of posterior pituitary hormones. 475 679 J11
2. Mention the hormones secreted by the posterior pituitary gland. Describe their actions and regulation. What is neuroendocrine reflex? Give one example. 475, 480 679 J07

Short Essays

1. Explain the regulation of secretion of anti-diuretic hormone (ADH). 476 680 D17(RS3)
2. What are functions of ADH? What is the mechanism of action? Explain its role and its regulation. 477 680 J15
3. Explain the basis of any two features of diabetes insipidus. 478 681 D05(RS2)
4. Function of oxytocin. 479 681 J17(RS3)
5. Describe the milk ejection reflex. 479 682 J10(RS2),
J12(RS3),
J00
D15
6. Describe neuroendocrine reflexes with examples. 480 —

Short Answers

1. Explain why polyuria occurs in diabetes insipidus. — 681 D13(RS3),
D02
2. Antidiuretic hormone (vasopressin) and its action. 475 679 J10(RS2),
D10(RS2),
J99, J01,
D01, D04

Contd...

Contd...

	GKPAL	AKJN	
3. Explain how antidiuretic hormone acts on collecting duct.	477	680	J09
4. Diabetes insipidus (basis, lesion, features).	478	681	D18(RS3), D07
5. Mention the likely mode of development of diabetes insipidus and its resultant signs and symptoms.	478	681	J11(RS2)
6. Oxytocin.	479	681	D09(RS2), J13(RS3), J18(RS3)
7. Describe milk ejection reflex with diagram.	479	682	J07(RS2), D15(RS3), J05
8. Describe neuroendocrine reflex.	480	—	D00
9. Role of oxytocin in female reproduction/parturition.	480	682	J03, J06

CHAPTER 57: THYROID GLAND

Long Essays

1. Describe the steps in the biosynthesis, storage and release of thyroid hormones (thyroxine) and indicate the clinical application of this knowledge. Describe the regulation and functions of thyroid hormone. What is "Wolff Chaikoff" effect? Add a note on hypothyroidism/myxedema/cretinism. Indicate two sites where antithyroid drugs act and specify the substance at each. 483, 487, 689, 692, 488, 494, 694, 698 D06(RS2),
D10(RS2),
D15(RS3),
J16(RS3),
D99, J02,
D04, D08,
J13
2. Describe the physiological effects of thyroid hormones (on general metabolism, cardiovascular system and central nervous system). Briefly explain the physiological basis of the features of hyperthyroidism. 489, 492 694, 698 D05, D16

Short Essays

1. Describe the differences between 'pituitary dwarf' and 'thyroid dwarf'. — 675 D02
2. Compare cretinism and dwarfism. — 675 D18(RS3)
3. Describe the biosynthesis and functions of thyroxine. 483 689 J06
4. Steps in thyroid hormone synthesis and their clinical applications. 483 689 J15(RS3)

Contd...

Contd...

	GKPAL	AKJN	
* Regulation/feedback control of thyroid hormone secretion. 487	693	J06(RS2), D16(RS3), D17(RS3)	
6. Effects of thyroxine on body metabolism. 489	694	D08(RS2), D00, D01	
* Cardiovascular and central nervous system (CNS) effects of thyroxine. 489	695	D07(RS2)	
8. Explain the basis of three features of hyperthyroidism. 492	699	J05(RS2)	
* Hypothyroidism (effects of hyposecretion of thyroid hormone)—clinical features and their physiological basis. 494	698	J07(RS2), J14(RS3), J10	
10. Myxedema (causes and features). 494	698	D12, D13, J15	
11. What is cretinism? How can it be prevented? 495	698	J11	
12. Enumerate thyroid function tests. 495	700	D09, J14	
Short Answers			
1. What are the differences between — pituitary dwarfism and cretinism? —	675	D15(RS3), J11	
2. Explain the mechanism of action of thyroxine. 488	662	D10	
3. Mechanism of increased basal metabolic rate (BMR) in hyperthyroidism. 489	694	D08(RS2)	
4. Explain the cause of tachycardia in hyperthyroidism. 490	695	D14	
5. List the features of Grave's disease. 493	699	J10(RS2)	
6. Physiological basis of use of a drug in the treatment of thyrotoxicosis. 493	700	D07(RS2)	
* Myxedema (clinical features). 494	698	J09(RS2), D09(RS2), J13(RS3), D00	
8. Explain the skin changes occurring in hypothyroidism. 494	698	D16	
* Cretinism (clinical features). 495	698	J11(RS2), J12(RS3), J18(RS3), J98, J03, J07, J08	
10. Thyroid function tests (describe any two). 495	700	J12(RS3), J17(RS3), D98, D98, J12	

Contd...

Contd...

GKPAL

AKJN

CHAPTER 58: ADRENAL GLAND: THE ADRENAL MEDULLA

Short Essays

* Compare and contrast actions of epinephrine and norepinephrine. —	—	D09(RS2), J13(RS3), J03
2. Compare the effects of epinephrine and norepinephrine on heart and blood vessels. —	—	J05
3. Physiological basis of differences in cardiovascular effects of adrenaline and noradrenaline. —	742	D08(RS2)
4. Describe the effect of any two hormones on stomach. —	744	J07
* Explain how the epinephrine secretion is regulated. 500	740	D13(RS3)
6. Enumerate the physiological actions of catecholamines. 502	741	D13

Short Answers

1. Name the adrenal medullary hormones. 499	738	J04
2. Name the catecholamines and give two actions. 499	738	J15
3. Explain 'flight or fight' reaction. 502	740	J09
4. What is pheochromocytoma? Which hormones increase in the blood circulation in this condition? 504	745	J11

CHAPTER 59: ADRENAL CORTEX

Long Essays

1. Enumerate the hormones secreted by adrenal cortex. Describe the actions, regulation of secretion of glucocorticoids. Add a note on Cushing's syndrome. 507, 514, 722, 726, 512, 520 724, 729	507, 514, 722, 726, 512, 520 724, 729	D12, D13
2. What are steps in secretion of glucocorticoids? Write about the mechanism of action of glucocorticoids and about their functions. Add a note on Addison's disease. 508, 513, 723, 726, 514, 522 734	508, 513, 723, 726, 514, 522 734	D16(RS3)
3. Describe regulation and functions of cortisol. 512, 514 724, 726 D11	512, 514 724, 726 D11	
* What are mineralocorticoids? What is their mode of action? Describe the regulation and functions of aldosterone. Add a note on Conn's syndrome. 523 730, 732, 733	523 730, 732, 733	D09(RS2), J13(RS3), D17(RS3), J10

Contd...

Contd...

	GKPAL	AKJN
Short Essays		
1. Functions of cortisol.	514	726
2. Describe the actions of glucocorticoids/ cortisol during stress response.	514	728
3. Describe the effects of cortisol on inflammation and allergy.	517	728
* Cushing's syndrome (causes and clinical features and their basis).	520	729
5. Explain the basis of two features that are seen in hyperfunctioning of the adrenal cortex.	520	729
6. Enumerate the actions of aldosterone (mineralocorticoids). How is its secretion regulated?	523	730
Short Answers		
1. Diagram to show regulation of secretions of aldosterone.	—	—
2. Name the zones of adrenal cortex and hormones secreted by them.	507	721
3. Transcortin.	511	723
4. Explain with an example "permissive action" of hormones.	515	727
5. Explain, why cortisol is not advised in patients with osteoporosis.	516	727
6. Describe the anti-inflammatory action of cortisol.	517	728
7. Explain features of Cushing's syndrome.	520	729
* Addison disease (clinical features and their physiological basis).	522	734
9. What is the cause of hyperpigmentation in Addison's disease?	522	734
10. Androgenital syndrome (clinical features).	522	735

Contd...

Contd...

	GKPAL	AKJN
11. Give typical findings in the adrenogenital syndrome in a postpubertal woman.	522	735
12. Mention the factors regulating secretion of aldosterone.	523	732
13. Actions of aldosterone.	524	730
* Aldosterone escape.	524	732
15. Describe the effects of primary hyperaldosteronism.	524	733

CHAPTER 60: ENDOCRINE PANCREAS

Long Essays

1. Describe the endocrine regulation of blood glucose level. 611 J05(RS2)
2. Describe the physiological actions and regulation of secretion of insulin. 535, 531 753, 751 D13(RS3)
3. Describe the physiological actions of insulin on carbohydrate metabolism. List the features of diabetes mellitus. 535, 540 753, 755 D14

Short Essays

1. Hormonal regulation of blood glucose level. 611 D98, J06
2. Regulation of insulin secretion. 531 751 D14(RS3)
3. Factors that increases and decreases the insulin secretion. 531 751 J08(RS2)
- * Describe the mechanism of action of Insulin. 533 754 D11
5. Mechanism of insulin action at cellular level. 533 754 D09(RS2), J13(RS3)
6. Principal actions of insulin. 535 753 J11(RS2), J12(RS3), D15(RS3), D15
7. Explain the action of insulin on carbohydrate metabolism. 535 753 J15(RS3)
8. Name the hyperglycemic hormones. Explain the mechanism of actions of any one of them. 543 748 J01

Contd...

Contd...

GKPAL AKJN

9. Glucagon—sources, functions and regulation. 544 748

J08(RS2),
D16(RS3),
J98, D08, J09

Short Answers

1. Differences between diabetes mellitus and diabetes insipidus. — — J14(RS3), J13
2. Renal glycosuria. — — J99
3. Mention four hyperglycemic hormones that increase blood glucose level causing anti-insulin effect. — 612 D10(RS2), D10
4. Human insulin. 529 749 J09(RS2), J99
5. Explain the regulation of insulin secretion. 531 751 D13
6. Describe the mechanism of action of insulin. 533 754 D09, J14
7. Name hypoglycemic actions of insulin. 535 753 D03, D12
8. Effects of insulin on glucose transporters. 535 754 D07(RS2)
9. Diabetes mellitus. 538 755 D06
10. Explain why glycosuria occurs in diabetes mellitus. 541 — J01
11. Explain why polyuria occurs in diabetes mellitus. 541 — J03
12. Explain the basis of polyphagia in diabetes mellitus. 541 756 D09(RS2), J13(RS3)
13. List the features of hypoglycemia. 543 759 D12(RS3), D03
14. List the functions of glucagon. 544 748 J14(RS3), D00, J02, J15
15. Action of somatostatins. 545 277 D08

CHAPTER 61: CALCIUM AND PHOSPHATE METABOLISM AND PHYSIOLOGY OF BONE

Long Essays

1. What are the functions of calcium ions in the body? Describe the role of different hormones in plasma calcium regulation. Add a note on hypocalcemic tetany. 547, 550, 560 707, 712, 717 D12(RS3), J12
2. What is the normal calcium level in blood? Name the hormones required for calcium homeostasis. Describe how hormones regulate serum calcium level (endocrine regulation of serum calcium)? What are the clinical features of tetany? List two effects of hypercalcemia. 550, 560 707, 712, 717 D05(RS2), J07(RS2), J18(RS3), D18(RS3), J99, D01, D09, J14

Contd...

Contd...

GKPAL AKJN

Short Essay

1. What is the normal blood calcium level? How it is maintained? 550 707, 712 D98

Short Answers

1. List the functions of calcium in the body. 547 707 J02
2. Mention three hormones regulating blood calcium levels. State their mechanism of actions. 550 712 J15(RS3)
3. Explain the role of parathyroid hormone in calcium metabolism. 550 713 D08
4. What is the normal serum calcium level? List the hormones regulating it. 550 707, 712 J11(RS2), J07, J11

CHAPTER 62: PARATHYROID GLAND, CALCITONIN AND VITAMIN D

Short Essays

1. Regulation of parathormone secretion. 557 714 J07
2. Action of parathormone. 558 713 J14(RS3)
3. Describe the actions of parathormone. Name one antagonistic hormone. Describe the role of vitamin D in calcium metabolism. 558, 563 713 D99, J04, J08
4. Primary hyperparathyroidism. 559 718 J08(RS2)
5. What is tetany? What are causes, features and dangers of tetany. Describe signs of latent tetany. 560 717 D07, J15
6. Hypocalcemic tetany. 560 717 J06(RS2)
7. What is the normal serum calcium level? What are the features of tetany? 560 707, 717 D02
8. 1, 25-dihydroxy cholecalciferol. 562 712 J98
9. Give the source, target organ/s and actions of 'calcitriol'. 562 712 D13(RS3)
10. Physiological actions of vitamin D. 563 712 D14(RS3), D14

Short Answers

1. What is latent tetany? Explain one clinical test to detect it. — — J03
2. Four (functions) effects of parathormone. 558 713 D06, D10, D11
3. What are the features of hyperparathyroidism? 559 718 J12
4. What are the complications of hyperparathyroidism? 559 718 D07

Contd...

Contd...	GKPAL	AKJN	
5. Tetany (physiological basis, signs).	560	717	J09(RS2), J05, J09, D09, J14
6. List the features of hypocalcemic tetany.	560	717	D15(RS3)
7. Actions (on bone) and regulation of calcitonin secretions.	561	715	D03, J09, D16
8. Give the source, target organs and the actions of calcitriol.	562	712	D13
9. Role of vitamin D in the prevention of osteoporosis.	564	712	D08(RS2)

■ CHAPTER 63: PINEAL GLAND

None.

■ CHAPTER 64: LOCAL HORMONES

Short Answers

1. Prostaglandins.	572	769	J06
2. Atrial natriuretic factor.	573	565	J08(RS2)
3. What is the action of atrial natriuretic peptide (ANP) on the kidney?	573	565	J08

Section 7: REPRODUCTIVE SYSTEM

■ CHAPTER 65: SEX DIFFERENTIATION AND DEVELOPMENT, PUBERTY AND MENOPAUSE

Short Essays

1. Explain how sexual differentiation occurs in fetal life. Add a note on pseudohermaphroditism.	578	775, 780	J13
2. Turner's syndrome.	582	779	J06(RS2)

Short Answers

1. Explain what is Klinefelter's syndrome.	582	778	D13(RS3), D10
2. What is Turner's syndrome and how it is differentiated from Klinefelter's syndrome?	582	779	D07

■ CHAPTER 66: PHYSIOLOGY OF PUBERTY AND MENOPAUSE

Short Essays

1. Describe the physiological changes that occur at the time of puberty in boys (secondary sex characteristics in male).	585	783	D14(RS3), D05
2. Physiology of puberty in females.	585	781	D08(RS2)

Contd...

Contd...	GKPAL	AKJN	
3. What is menopause? Give its basis and features.	586	808	J04

Short Answers

1. Puberty.	584	781	J07(RS2)
2. Puberty and menarche.	584, 586	781, 783	D18(RS3)
3. List six secondary sexual characteristics in males.	585	783	D06(RS2)
4. Define menarche, menopause and amenorrhea and give timing of menarche and menopause.	586, 620	783, 808, 813	J05(RS2), J00

■ CHAPTER 67: MALE REPRODUCTIVE SYSTEM

Short Essays

1. Explain the functions of different types of cells in testis. What is 'capacitation' of sperms?	590	790, 819	D12
2. Sertoli cell and its role.	590	790	J09(RS2), D11(RS3)
3. Describe the blood-testis barrier.	591	790	D14
4. Describe the spermatogenesis and list the factors regulating it. Mention factors causing male infertility.	597	790	J10(RS2), D16(RS3), J18(RS3), D18(RS3), J98, D99, J00, J02, J03, D04, J05, D11, D13
5. Endocrine functions of testis.	599	795	D18(RS3)
6. Describe the source and actions of testosterone in fetal life and adult life (at puberty).	599	795	J11(RS2), D12(RS3), J14(RS3), D03, J08, D09, J14, J15, D16

Short Answers

1. Factors causing movements of sperms.	—	825	J07(RS2)
2. What is the importance of counter-current exchange of temperature in the blood vessels supplying the testes.	589	790	J11
3. Sertoli cells—location and functions.	590	790	J05(RS2), D17(RS3), D02, J11
4. Blood testis barrier and its importance.	591	790	D06, J11, J12

Contd...

Contd...

	GKPAL	AKJN
5. What are the functions of androgen binding protein?	592	778 D16
6. Write the role of epididymis, seminal vesicle and prostate in reproduction.	593	793 J15(RS3)
7. What is spermiogenesis and spermiation?	594	791 J11
8. Define and explain "capacitation" of sperms and give the normal sperm count.	596	819, 795 D11(RS3), J12(RS3), J05
9. Semen (composition).	597	795 J10(RS2), D12(RS3), D02, J10
10. List the factors regulating spermatogenesis.	597	791 D06(RS2), D17(RS3), J08, D12, D15
11. Changes after bilateral vasectomy.	599	— J12(RS3), J04
12. Endocrine functions of testis.	599	795 J17(RS3), J06
13. Give the source and any three actions of testosterone in adult life.	599	795 J13
14. What are the functions of testosterone?	600	796 D07
15. Describe the role of testosterone in fetal life.	601	796 D05(RS2)
16. Functions of testicular androgens.	602	796 J07
17. Inhibin (functions).	602	797 D08(RS2), D09(RS2), D12(RS3), J13(RS3), D05
18. Cryptorchidism—its effects on testis and its correction.	603	797 J99, D05, D07, D15

CHAPTER 68: FEMALE REPRODUCTIVE SYSTEM: FUNCTIONAL ANATOMY, OOGENESIS AND FOLLICULAR DEVELOPMENT

Long Essay

1. What are the functions of ovary? How are the ovarian functions regulated? 606, 627 804 J09(RS2)

Short Essays

1. Briefly describe the process of oogenesis. 607 804 J07
2. Describe briefly the formation and functions of corpus luteum. 610 809 D99, J04, J11

Contd...

Contd...

Short Answers

1. List the various stages in the development of ovarian follicle. Mention three tests of ovulation. 608 804 J05(RS2)
2. What is corpus luteum? How is corpus luteum formed? Mention its function. 610 809 D14(RS3), J18(RS3), J00, J02, D06, D08, D11, J13

CHAPTER 69: MENSTRUAL CYCLE AND OVULATION

Long Essays

1. Describe with neat diagram, the ovarian and endometrial changes during menstrual cycle. Explain their hormonal regulation. 615 808, 812 J15(RS3)
2. Illustrate the ovarian, endometrial and hormonal changes in menstrual cycle. What is amenorrhea and when does it occur physiologically? 615 811 D15
3. Describe the ovarian changes during normal menstrual cycle. Explain their normal basis. Mention the tests for detecting ovulation. What is its importance? Explain the mechanism of fertilization. 615, 619, 808, 825 D02, J09
4. Describe the endometrial changes during a normal menstrual cycle. Explain the role of different hormone in each phase. Add a note tests for ovulation. 615, 619 809 J17(RS3), D00, J01
5. Explain the interplay between ovarian and hypothalamic—pituitary hormones for regulation of menstrual cycle. 618 812 J08(RS2)
6. Discuss in brief the hormonal control of menstrual cycle. What is menopause? 618, 586 812, 808 J06(RS2)

Short Essays

1. Describe the ovarian changes during a menstrual cycle. 615 808 D06, J13, J15, D16
2. Follicular phase of menstrual cycle. 615 808 D12(RS3)
3. Describe the endometrial/uterine changes during menstrual cycle. 615 809 J11(RS2), J12(RS3), J14(RS3), D15(RS3), J12

Contd...

Contd...

	GKPAL	AKJN	
4. Discuss the endometrial changes and hormonal control of 'proliferative phase' of menstrual cycle.	615	810	D13
5. Describe the endometrial changes occurring in the secretory phase of the menstrual cycle. What is the hormonal basis for these changes?	617	810	D01
6. Describe ovulation and its regulation. What are test (indicators) of ovulation.	618	808	J07(RS2), D05, D09, J14
7. Describe the hormonal regulation of menstrual cycle.	618	812	D10
8. Describe the role of FSH and LH in regulation of ovarian cycle.	618	812	D08
9. Hormonal basis of endometrial changes during menstrual cycle.	618	812	D10(RS2)
10. Explain the indicators/different tests for ovulation.	619	809	D16(RS3), J18(RS3), D12
11. Name four tests to detect ovulation. Explain the basis of any two tests. Calculate the likely day of ovulation in a 32 day menstrual cycle.	619	809	D03
12. What is amenorrhea? When does physiological amenorrhea takes place in the woman?	620	813	J11
Short Answers			
1. Explain how 'endometrial biopsy' is used to assess fertility.	—	809	D05(RS2)
2. Ovulation.	618	808	J10(RS2), D98
3. What is ovulation and which hormone is essential for ovulation?	618	808	J11
4. List hormones regulating menstrual cycle.	618	812	J08, D11
5. Explain LH surge (cause and effect).	618	812	J16(RS3), J15
6. Tests for indicators of ovulation.	619	809	D07(RS2), D17(RS3), J00
7. Physiological amenorrhea.	620	—	J98
8. Explain the physiological basis of lactational amenorrhea.	620	—	D14
9. Anovulatory cycles.	621	812	D16(RS3)

Contd...

Contd...

CHAPTER 70: OVARIAN HORMONES AND CONTROL OF OVARIAN FUNCTIONS

Short Essays

1. Explain the actions/functions of estrogen. 624 806 D11(RS3), J12(RS3), J08
2. Hypothalamo-pituitary-gonadal axis in females. 627 — D07(RS2)

Short Answers

1. List (four/three) functions of estrogen on female genital tract/mammary gland. 624 806, 845 D06(RS2), D12, D14
2. Actions of progesterone on fallopian tube, myometrium and mammary glands. 626 807, 845 J14(RS3)

CHAPTER 71: PHYSIOLOGY OF COPULATION

Short Answer

1. Explain the mechanism of ejaculation of semen. 632 818 J09

CHAPTER 72: PREGNANCY AND PARTURITION

Short Essays

1. Pregnancy tests (immunological tests). — 829 J09(RS2), D16(RS3), D18(RS3)
2. Fetoplacental unit. 639 828 D10(RS2), J99
3. Describe the (hormonal) functions of the placenta. 641 826 J16(RS3), D01
4. Human chorionic gonadotropin. 641 826 J10(RS2)
5. Discuss the physiological changes during pregnancy. 642 830 D08
6. Cardiorespiratory changes in mother during third trimester. 643 830 J07(RS2)
7. Describe the maternal changes in cardiovascular system during pregnancy. 643 830 D14
8. Explain the mechanism of parturition. 646 831 J12

Short Answers

1. Explain the physiological basis of any one test to investigate the cause of infertility in a male. — — D13(RS3)

Contd...

Contd...

	GKPAL	AKJN	
2. Tests for pregnancy (name two with physiological basis) (immunological tests).	—	829	J16(RS3), D98, J06, J07
3. Fetoplacental unit	639	828	D09(RS2), J13(RS3)
4. Infertility in female.	640	—	D09(RS2), J13(RS3)
5. Placental hormones.	641	826	J09(RS2), J17(RS3), J00, J09
6. Human chorionic gonadotropin (source, functions and clinical significance)	641	826	J14(RS3), J98, J10, D12
7. What are the structures that produce human chorionic gonadotropin (hCG) and mention the functions of hCG.	641	826	D07
8. Draw a graph to show the hCG level throughout pregnancy.	641	827	J05(RS2)
9. What are the functions of human chorionic somatotropin?	642	827	D16

CHAPTER 73: PHYSIOLOGY OF BREAST DEVELOPMENT AND LACTATION

Long Essay

- Describe the role of different hormones in growth and development of breast. What is the role of prolactin and oxytocin in lactation. 649, 651 845 J08

Short Essays

- Explain the importance of breastfeeding in prolactin secretion. — 678 J10
- Describe the hormonal control of breast development and lactation. 649, 651 845 D15(RS3), J01, D10

Short Answers

- Explain the effect of individual sex steroids on mammary gland development. 649 845 D13(RS3)
- Hormonal control of lactation (enlist and specify their role). 651 845 D99, D04, D06, D09, J14, J15

CHAPTER 74: PHYSIOLOGY OF CONTRACEPTION

Short Essays

- Describe the role of hypothalamus as a target for anti fertility agents. — — J06

Contd...

Contd...

	GKPAL	AKJN	
2. Discuss the neuroendocrinal basis for the use of oral contraceptives.	—	823	D06
3. Explain the methods of contraception in male.	653	821	D00, J02, D04
4. Intrauterine contraceptive devices.	653	822	D14(RS3)
5. Explain the mechanism of action of oral contraceptive pills to prevent pregnancy.	654	823	J03, J10
6. Explain the permanent methods of family planning.	656	821, 822	J11

Short Answers

- On a line diagram, indicate the 'safe period' in a 30-day menstrual cycle and give the significance of this knowledge. — — D05(RS2)
- List the methods of contraception in female. 821 D13(RS3), J00, J13
- Intrauterine contraceptive devices (IUCD) and their mechanism of action. 822 D18(RS3), J99, D03
- Explain the mechanism by which oral contraceptives prevent pregnancy. 823 D06(RS2), J11(RS2), J12(RS3), D01, D04
- Endocrine basis of use of oral contraceptives in female. 654 823 J15
- Safe method of family planning. 655 822 J09(RS2), J06
- Permanent method of contraception. 656 821, 822 J07

Section 8: RENAL SYSTEM

CHAPTER 75: GENERAL INTRODUCTION AND FUNCTIONAL ANATOMY OF KIDNEY

Short Essays

- Functions of kidney. 659 512 D18(RS3), J11
- Endocrine functions of kidney. 659 513 J98
- What is the length and diameter of proximal tubule of nephron? What the substances reabsorbed in this tubule? 661 509 J08
- Draw a diagram to show the structure of the renal filtration membrane. Explain the significance of each layer. 664 508 J04

Contd...

Contd...	GKPAL	AKJN
5. Juxtaglomerular apparatus (formation, diagram, hormones secreted and functions).	666	510
6. Explain rennin-angiotensin mechanism.	667	512
7. What is renin? What is the stimulus for its production? How it will help in regulation of blood pressure?	667	511
Short Answers		
1. Functions of proximal convoluted tubules.	—	509
2. Name the synthetic functions of kidney.	—	513
3. List the functions of kidney.	659	512
4. Mention the non-excretory/extrarenal functions of kidney.	659	512
5. How is the structure of proximal tubule of kidney related to its function?	661	509
6. Draw a neat labeled diagram of a nephron.	661	509
7. Loop of Henle and its function.	661	510
8. Explain functions of collecting ducts of nephron.	662	510
9. Juxtamedullary nephron.	663	510
10. Draw a neat labeled diagram of the glomerular filtering membrane.	664	508
11. What is the physiologic role of mesangial cells?	665	511
12. Juxtaglomerular apparatus and its functions.	666	510
13. What is the important function of macula densa in distal tubule of nephron?	666	511
14. Renin.	667	511
15. Angiotensin II.	668	512

Contd...

Contd...

CHAPTER 76: RENAL BLOOD FLOW

Short Essays

1. Describe the peculiarities (special features) of renal circulation. Explain the significance of one.	515	D18(RS3), D00, D11
2. Describe the hemodynamics of blood flow through the kidneys.	671	513
3. Regulation of renal blood flow.	674	516
4. Autoregulation of renal blood flow.	674	516

Short Answers

1. List four special features (peculiarities) of renal circulation.	—	510
2. What is the cause of medullary hyperosmolarity in kidney?	671	516
3. What is the functional significance of rich blood flow through renal cortex?	671	516
4. What is the functional significance of slow blood flow through the renal medulla?	671	516
5. Explain the role of 'vasa recta' in renal function.	672	551
6. Why is renal medulla very susceptible to hypoxic damage?	673	516
7. Define autoregulation of renal blood flow? What is its importance?	674	516

CHAPTER 77: GLOMERULAR FILTRATION

Short Answers

1. Describe the dynamics of glomerular filtration.	676	522
2. Calculation of net filtration pressure at glomerulus.	677	522
3. Give the formula to determine effective filtration pressure in glomerular capillaries and state the normal values. Explain the significance of any one.	677	522
4. Filtration coefficient.	677	522
5. How much is the hydrostatic pressure in the glomerulus of malpighian body and what is its importance?	677	522

Contd...

Contd...	GKPAL	AKJN
6. Glomerular filtration rate (define, normal value, factors influencing, measurement).	678	522
		J07(RS2), D08(RS2), D09(RS2), J12(RS3), D12(RS3), D13(RS3), J15(RS3), D15(RS3), J16(RS3), J17(RS3), J01, D01, D02, J03, D04, D09 J18(RS3), J98, D15 D10(RS2)
7. Filtration fraction—define and calculation.	679	524
8. Role of angiotensin II in glomerular filtration rate.	680	523
9. Explain the tubuloglomerular feedback mechanism and explain the role of tubuloglomerular feed back in auto-regulation of GFR (glomerular filtration rate).	681	516
		J11
■ CHAPTER 78: TUBULAR FUNCTIONS		
Long Essay		
1. Describe the mechanism of formation of urine.	682	521
		D06(RS2)
Short Answers		
1. Name the steps in formation of urine. Explain their significance.	682	521
		J05
2. Define renal threshold. What is its value for glucose?	685	526
		D05
3. What are the substances reabsorbed in the proximal convoluted tubule.	685	527
		J12
4. Describe the renal tubular handling of sodium.	685	530
		J12(RS3), J00
5. Sodium reabsorption by renal tubules (PCT).	685	530
		J07(RS2), J13(RS3), J10, J13
6. Describe the reabsorption of water along renal tubules.	686	535
		D00

Contd...

Contd...	GKPAL	AKJN
7. Describe the reabsorption of glucose in the renal tubules with a labeled diagram. Define "TmG" and "renal threshold". Give the normal value for renal threshold and transport maximum for glucose. Name one substance which inhibits reabsorption.	687	527
		J11(RS2), D98, J00, D02, D03, D04, J07, D07, D13, J15
8. Glucose reabsorption curve in renal tubules.	687	527
		D18(RS3)
9. What is meant by renal threshold for glucose and transport maximum of glucose (T_m for glucose)?	688	527
		J98, D01, D04, D12
10. Briefly describe the reabsorption of sodium in distal convoluted tubule.	691	530
		D05
11. Name four hormones acting on renal tubules (influence urine formation).	695	564
		D99
12. What is role of ADH in urine formation?	696	564
		D14

■ CHAPTER 79: MECHANISMS OF URINE CONCENTRATION AND DILUTION**Long Essays**

1. Describe the renal mechanisms of maintenance of normal specific gravity of urine.	699	550
		J06(RS2)
2. Discuss the mechanism of formation of concentrated urine. Add a note on diuresis.	700, 707	550, 553
		D07(RS2), J18(RS3)
3. Describe the counter-current multiplier system. What is its role?	701	550
		D12(RS3)

Short Essays

1. Describe the role of the kidney in water balance.	700	563
		J13
2. Describe in detail how urine is concentrated in the kidney.	700	550
		D14(RS3)
3. Counter current multiplier system in kidney.	701	550
		D17(RS3)
4. Counter-current mechanism and its importance.	701	550
		J15(RS3), J98, D06, J09
5. Role of kidney tubule in counter-current mechanism.	702	550
		J14(RS3)

Short Answers

1. Briefly describe the counter-current mechanism.	701	550
		D05

Contd...

Contd...	GKPAL	AKJN	
2. Which are called counter current multipliers in the nephron and what are their importance?	701	550	J08
3. Role of loop of Henle in urine concentration mechanism.	701	550	J08(RS2)
4. What happens to the tubular fluid in thick ascending segment?	702	551	J07
5. What happens to the tubular fluid in the collecting duct?	702	551	D05
6. The role of ascending limb in urine formation.	702	551	D16
7. Give the role of counter-current exchangers in the kidneys.	703	551	J05
8. What is the role of vasa recta in counter-current mechanism?	703	551	J16(RS3)

■ CHAPTER 80: WATER EXCRETION, DIURESIS AND DIURETICS

Long Essay

1. Illustrate the mechanism of water reabsorption in different segments of nephron.	707	535	D11(RS3)
---	-----	-----	----------

Short Essays

1. Compare water reabsorption in proximal and distal nephron.	—	—	D12
2. Diuresis.	707	553	J09(RS2)

Short Answers

1. Outline the differences in the reabsorption of water in PCT from that of DCT.	—	—	D13(RS3)
2. What is meant by facultative absorption of water and obligatory absorption of water? Where does it take place?	705	536	D01, D04, J06
3. What is facultative reabsorption of water (in distal convoluted tubule) and the effect of its defect?	705	536	D15, D16
4. Explain how water is reabsorbed in collecting duct	707	536	D10
5. Osmotic diuresis.	707	554	D05(RS2), D98, J14
6. Diuretics	707	554	D16(RS3)

Contd...

Contd...

■ CHAPTER 81: ACIDIFICATION OF URINE

Short Essays

1. Acidification of urine.	711	558	D09(RS2), J17(RS3)
2. Describe the buffer systems of the kidney.	712	558	D09
3. Role of renal tubular buffers.	712	559	J13(RS3)

Short Answers

1. Explain the mechanism of absorption of bicarbonate in the renal tubules.	710	532	D02, D07
2. Explain how bicarbonate ions are generated in the renal tubules.	710	533	J05(RS2)
3. How does renal tubule secrete ammonia? What is its role in acidification of urine?	710	559	J01
4. What are the substances synthesized and excreted in the collecting duct of nephron helping in increasing acidity of urine?	710	558	J08
5. Name the buffers of renal tubules.	712	559	D17(RS3)

■ CHAPTER 82: KIDNEY FUNCTION TESTS AND PATHOPHYSIOLOGY OF RENAL FAILURE

Short Essays

1. Renal dialysis.	—	546	J10(RS2)
2. What is artificial kidney? Explain the physiological basis of artificial kidney. Give any two indications.	—	546	D06, D11
3. Describe/enumerate renal function tests. How is renal blood flow measured?	715, 673	574, 544	J06, D07
4. Define renal plasma clearance of a substance. Give the formula for clearance and explain its utility in the study of renal functions.	718	541	D15

Short Answers

1. Nephrotic syndrome.	—	—	D08(RS2)
2. Artificial kidney—describe, principle, function, importance.	—	546	J00, J02, J04, J09, J10
3. Inulin clearance test.	—	542	J15(RS3), J09
4. What is the normal value of inulin clearance? What is its significance?	—	542	D14(RS3), J14
5. What is creatinine clearance test? What is its significance?	—	542	D13

Contd...

Contd...

	GKPAL	AKJN	
6. Explain why creatinine clearance is used to estimate glomerular filtration rate.	—	542	J05(RS2)
7. What is PAH clearance test? What is its significance?	—	543	D09
8. Explain urea clearance test.	—	545	D07
9. How is a substance handled by the kidney if its 'clearance rate' is 160 mL per minute?	718	—	J13
10. Define plasma clearance in kidney.	718	541	D11
11. Define renal clearance. Give the normal value for PAHA and inulin clearance. What do they indicate?	718	541	D18(RS3), D00, J02, D02, J07

CHAPTER 83: PHYSIOLOGY OF MICTURITION AND BLADDER DYSFUNCTIONS

Long Essay

- Describe the nerve supply of the urinary bladder and the mechanism of micturition. What is cystometrogram? 722, 724 579 D99, J02, D10

Short Essays

- Describe innervation of the urinary bladder with help of a diagram. Explain the process of micturition. 722, 724 579 D03, J09
- Draw a labeled diagram of innervation to urinary bladder. Explain how micturition is affected in spinal shock. 723, 726 580 J05
- Explain Laplace law. What is cystometrogram? 724 581 D08
- What is cystometrogram (pressure volume relationship in urinary bladder)? Draw a labeled diagram. 724 581 D05(RS2), D07(RS2), D17(RS3)
- Mechanism and regulation of micturition. 724 581 J16(RS3)
- Describe micturition reflex. Write a note on automatic/tonic bladder. 724 581 J12
- Describe the spinal reflex arc for micturition, with a labeled diagram and explain two disorders of micturition. 724 582 D98
- Automatic bladder. — 583 J10(RS2)

Short Answers

- What is volume obligatoire? — 537 D07(RS2), J11

Contd...

Contd...

	GKPAL	AKJN	
2. Explain how the structure of the urinary bladder is suited to its function.	—	579	J05(RS2)
3. Parasympathetic innervation of urinary bladder.	722	580	J15(RS3)
4. Draw diagram to show nerve supply to urinary bladder and its sphincters.	723	580	D06(RS2), J09(RS2), D07
5. What changes take place as the urinary bladder gets filled with urine? Give reasons for the changes.	724	581	D12
6. What is "cystometrogram"? Name the physical law.	724	581	D09(RS2), J10(RS2), J13(RS3), J17(RS3)
7. Draw a labeled diagram of pressure volume curve of urinary bladder or cystometrogram (pressure changes within urinary bladder as it is gradually filled).	724	581	J07(RS2), D01, J03, D04, D05, J07
8. Draw a diagram to show the pathway for micturition reflex.	725	582	D13(RS3)
9. Spastic neurogenic bladder.	726	584	D10(RS2), J14(RS3)
10. Atonic bladder.	—	—	D16

Section 9: CARDIOVASCULAR SYSTEM

CHAPTER 84: FUNCTIONAL ORGANIZATION OF CARDIOVASCULAR SYSTEM

Long Essay

- Describe the role of the different types of blood vessels. Explain how it is related to their structure. 732 314 J04

Short Essay

- Name the different types of blood vessels and give an example for each. Explain the role of any one type. 732 314 J05

Short Answers

- Types of blood vessels and their significance. 732 314 D14
- What is Windkessel effect? What is its importance/functions? 732 315 J12(RS3), J14(RS3), D16(RS3), D00, D07

Contd...

Contd...

	GKPAL	AKJN	
3. What are: (a) Resistance vessels, (b) Capacitance vessels, (c) Exchange vessels?	733	315	J01
4. Which segments of vascular system contribute the resistance to blood flow and why? Give the formula relating resistance to pressure and flow.	733, 804	315, 318	D11(RS3)
5. Capacitance vessels.	733	316	J08(RS2)
6. Differences between pulmonary and systemic circulation.	734	—	D05(RS2), D15(RS3)

■ CHAPTER 85: FUNCTIONAL ANATOMY OF HEART, CARDIAC MUSCLE, CONDUCTING SYSTEM AND CARDIAC INNERVATION

Long Essay

1. Draw a labeled diagram of the conducting system of heart. Describe the conducting system of heart and its importance. Explain the pathway of spread of cardiac impulse. What is AV nodal delay? What is its importance?

Short Essays

1. Discuss the length-tension relationship in cardiac muscle.
2. Define Sterling's law of the heart and explain its importance with the help of a graph.
3. Conducting system of heart and mention velocity of conduction.
4. Draw a diagram and explain the location and role of each part of the conducting system of the human heart.
5. Draw a diagram of special conducting system of heart. How is idioventricular rhythm produced?
6. Name the internodal tracts in the conducting system of heart. Explain the importance of AV nodal delay.
7. Compare the velocity of conduction in various parts of conducting system of heart. Give the significance of the slowest and fastest parts.
8. Innervations of the heart.

Contd...

Physiology

171

Contd...

Short Answers

1. Intercalated disc and its significance.
2. Define Sterling's law of muscle contraction. Explain its molecular basis. How it is applied in case of cardiac muscle.
3. Define Frank-Starling's law of heart.
4. Draw and label the pathway of impulse conduction in heart.
5. Name the special conducting (junctional) tissues of the heart.
6. Explain what is vagal tone? What determines it? Mention its importance.
7. What are the effects of parasympathetic (vagal) stimulation on heart?

■ CHAPTER 86: PROPERTIES OF CARDIAC MUSCLE

Long Essay

1. Describe the properties of cardiac muscle.

Short Essays

1. Properties of cardiac muscle.
2. List the properties of cardiac muscle. Explain its refractory period.
3. Enumerate the properties of cardiac muscle. Explain importance of the long refractory period.

Short Answers

1. Mention properties of cardiac muscle.
2. Name the properties of cardiac muscle and what is the importance of absolute refractory period.
3. What is physiological basis of autorhythmicity?
4. SA node as pacemaker.

Contd...

Contd...

	GKPAL	AKJN	
5. Refractory period of a cardiac muscle fiber and its significance. 748	186	J09(RS2), D18(RS3), J15	
6. Why the cardiac muscles will not undergo tetanus or fatigue? 748	186	J03	
7. Explain "all or none law" with respect to cardiac muscle and skeletal muscles. 749	186	D16(RS3), D01, D02, D04, D09, J10, J14	
8. Define: (a) All or none law and (b) Starling's law. 749, 741	186	D99	
9. Define 'all or none law' and 'absolute refractory period'. 749, 748	41	D12	
10. What is the mechanism of staircase phenomenon? 749	187	D05	

■ CHAPTER 87: ELECTROPHYSIOLOGY OF THE HEART

Short Essays

1. Cardiac action potential (ventricular muscle action potential). 753	180	D10(RS2)
2. Draw and describe cardiac pacemaker potential and explain the ionic basis. 755	180	J12(RS3), D13(RS3), J14(RS3), J07
3. Describe the generation of impulse in sinoatrial node. 755	182	J11
4. Draw a labeled diagram to show the membrane potential of cardiac pacemaker tissue. Explain the effect of vagal stimulation on this potential. 755	181, 328	J04
5. Generation and conduction (mode of propagation) of cardiac impulse over the heart. 757	182	D05(RS2), J01, J03, D10, D14, D15

Short Answers

1. Draw and label the ventricular muscle action potential. 754	180	D02
2. Pacemaker potential (draw and label). 755	181	J13(RS3), D11
3. What is the effect of sympathetic stimulation on pacemaker potential? 756	182	J16(RS3)
4. Significance of AV nodal delay. 757	182	J05

Contd...

Contd...

■ CHAPTER 88: ELECTROCARDIOGRAM

Long Essays

1. What is ECG? Enumerate the various ECG leads with a suitable diagram. Discuss the various waves, intervals and segments in a normal ECG and their importance. 760	294	J08(RS2), D17(RS3), J09
2. Name the lead systems employed in recording electrocardiogram. Describe a normal ECG/draw and label a typical electrocardiogram and explain the causation of various deflections and intervals. 760, 762, 764	297, 295	J11(RS2), D18(RS3)
3. What is Einthoven's triangle? Describe the electrocardiogram in lead II. Add a note on his bundle electrocardiogram. 760, 776	297, 295	D06
4. Draw and describe a normal lead II electrocardiogram. 761	295	J07
5. Explain the principle, method of recording, waves and intervals of electrocardiogram. 763, 760	294	J13(RS3)
6. Give an account of the principles and methods used to obtain and ECG (electrocardiograph) record in man. Discuss how an ECG recording helps to evaluate conduction disorders of the heart. 763, 760, 294	294	J06

Short Essays

1. Explain Einthoven's law. —	—	D13
2. Cardiac arrest. —	—	J10(RS2)
3. Standard limb leads. 760	299	D08(RS2)
4. Diagrammatically represent a normal ECG. Explain normal waves and causes for different waves. 762	295	D00, J03, D05
5. RR and QT interval in ECG. 762	297	D16
6. R-R interval and its significance. 763	—	D18(RS3)
7. QRS complex. 764	296	D15(RS3)
8. PR interval. 764	296	J08(RS2), J09(RS2)
9. Mean electrical axis of QRS vector. 769	300	D14
10. Paroxysmal tachycardia. 771	304	J10(RS2)
11. Heart block. 772	300	J10(RS2)

Contd...

Contd...

	GKPAL	AKJN
12. Explain what is incomplete and complete heart block.	772	301 J10
13. Ventricular fibrillation.	772	305 J10(RS2)
14. Stokes Adam syndrome.	773	301 J10(RS2)
Short Answers		
1. Einthoven's triangle.	760	297 J06(RS2)
2. What is the role of augmented limb leads?	760	299 D16(RS3)
3. Waves of EEG.	761	295 D07(RS2)
4. List chest leads of ECG. Give their location.	761	297 J12
5. Draw a labeled diagram of normal electrocardiogram recorded from lead II.	762	295 D07(RS2), D10(RS2), D98, D99, J01, D01, D04, J13
6. PR interval in ECG—define, normal value, events occurring, significance.	762	296 D16(RS3), J17(RS3), J98, J99, D02, D03, D09, D12
7. Importance of QT interval of ECG.	762	297 D13
8. Give the cause of the 'P' wave of the ECG. Explain the abnormalities of 'P' wave of ECG. State two conditions which alter this wave.	768	295 J05(RS2), D16
9. What is the cause of 'T' wave in the ECG? In which leads is it inverted normally?	769	295 J09
10. Sinus arrhythmia—define and causes.	771	— D11(RS3), D12(RS3), D17(RS3)
11. What is bundle of Kent and what ECG changes are demonstrated in its presence?	773	306 D08
CHAPTER 89: CARDIAC CYCLE		
Long Essays		
1. Define cardiac cycle. Explain with the help of a diagram the mechanical changes during cardiac cycle.	778	287 D15(RS3), J00, J14
2. Explain the phases of a normal cardiac cycle. Draw left ventricular pressure tracing.	778	287, 289 D12

Contd...

Physiology

Contd...

	GKPAL	AKJN
3. With the help of a labeled diagram describe the changes in left ventricular pressure during cardiac cycle.	—	289 D05
4. Draw a neat labeled diagram of the cardiac cycle, correlating it with pressure and volume changes. Explain the events in detail.	779	289 J09(RS2)
Short Essays		
1. Left ventricular pressure changes.	—	— D08
2. Describe phonocardiogram.	—	— J12
3. Give the normal value of end-diastolic ventricular volume. Name two factors that increase this volume and explain its significance in ventricular function.	—	288 J05
4. Normal cardiac cycle.	778	287 J99
5. Ventricular events of cardiac cycle.	779	288 D11(RS3), D06
6. Draw the diagram of left ventricular pressure-volume loop and explain the causation of component segments.	782	— D15
7. Describe right atrial pressure changes during cardiac cycle.	783	290 D10
8. Jugular venous pulse tracing (causes of each wave).	783	290 D09(RS2), J13(RS3), J16(RS3), J17(RS3), J08
9. First and second heart sounds.	784	291 J06(RS2)
10. Heart sounds and murmurs.	784	291 J13(RS3), J18(RS3)
11. How are heart sounds produced? Mention their characteristics and clinical significance?	784	291 D98
12. Tabulate the differences between first and second heart sounds. Add a note on splitting of II heart sound.	784	291 D07(RS2)
13. Explain the causes of four heart sounds during cardiac cycle. How are these recorded?	784	291 J08
Short Answers		
1. Write briefly the right ventricular pressure changes during cardiac cycle.	—	— J09
2. Write briefly on volume changes in the ventricles during cardiac cycle.	—	— J09

Contd...

Contd...

	GKPAL	AKJN	
3. Phonocardiogram.	—	—	D12(RS3)
4. Differentiate first and second heart sounds.	—	291	J12(RS3), D14(RS3), J00, J01
5. Jugular venous pulse (labeled diagram).	783	290	J18(RS3), D05
6. Explain the causes of heart sounds.	784	291	D07
7. First heart sound—describe.	784	291	D11
8. Second heart sound—describe, cause.	784	291	J06, J12

CHAPTER 90: CARDIAC OUTPUT

Long Essays

- Describe cardiac output. Give its normal resting value. How is it regulated? 787, 794 342 D13(RS3), J15(RS3)
- Define cardiac output. Discuss factors affecting it. Add a note on left ventricular failure. 787, 790 342, 394 D16
- Define cardiac output and cardiac index. Give their normal values. Describe the factors, which regulate cardiac output and mention any one method of its determination. 787, 790, 342, 345 J15
- What is the normal cardiac output? Describe the various methods used for determining it. Write a note on cardiac index. 787 342, 345 J12
- Discuss the regulation of cardiac output. Write a note on cardiac reserve. 794, 788 342 D06(RS2)

Short Essays

- Define cardiac output and mention the factors regulating it. Describe one method of its measurement. 787, 794, 342, 345 J98, D99, J01, D01, J06, J08
- Define Fick's principle. Give details of estimation of cardiac output based on it. 789 345 J11(RS2)
- Describe the measurement of cardiac output by dye-dilution technique. 789 346 J10
- Explain how preload affects cardiac output. 791 344 D12
- Venous return. 791 344 D12(RS3)
- Explain factors influencing (promoting) venous returns. 791 344 D11(RS3), D17(RS3), D01

Contd...

Contd...

	GKPAL	AKJN	
Short Answers			
1. Define stroke volume. Give its normal value.	787	342	J14
2. Cardiac index.	787	342	J06(RS2)
3. Define cardiac reserve.	788	342	D11
4. Name the methods of measurement of cardiac output.	788	345	D15(RS3)
5. State Fick's principle. Explain how it is applied to determine cardiac output.	789	345	J18(RS3), J00, D00, D02, D03, D11
6. Venous return.	791	344	J13(RS3)
7. Name the factors increasing the venous return to right atrium.	791	344	D98, J09

CHAPTER 91: HEART RATE AND ARTERIAL PULSE

Long Essay

- Describe the baroreceptors control of heart rate. Name six other affecting the heart rate. 798 340 D03

Short Essays

- What is normal heart rate? How is it regulated (nervous regulation)? 797 339 J99, J08
- Explain the effects of vagal stimulation on heart. 798 328 J13
- Describe the normal 'arterial pulse' and 'jugular venous pulse'. 799, 783 — D12
- Water-Hammer pulse. 800 — D08(RS2)

Short Answers

- What is Bain bridge reflex? What is its importance? 798 334 D11(RS3), J16(RS3), J01, J02, D02, J11
- Draw a labeled diagram of arterial pulse. 799 — J07
- What is bradycardia? In which subjects is it observed physiologically and explain the reason? 800 339 D08

CHAPTER 92: PRINCIPLES OF HEMODYNAMICS

Short Essays

- What is Hagen's Poiseuille's law? Write the formula and explain its application. 805 319 J08(RS2), D10(RS2), D14(RS3)

Contd...

Contd...

	GKPAL	AKJN	
2. Poiseuille-Hagen formula. Name two factors the normally alter in it and explain the effect of each.	805	319	J04, D09
3. What is turbulent flow of blood? Where is it taking place physiologically? How it is measured?	805	320	D08
4. Peripheral resistance.	806	352	D99

Short Answers

1. Write the Poiseuille-Hagen formula and state its importance.	805	319	J05(RS2), J06
2. What is Reynold's number and what is its significance?	805	320	D10(RS2), D10, J15
3. Peripheral resistance and factors influencing it.	806	352	J18(RS3), J99

CHAPTER 93: ARTERIAL SYSTEM**Short Essay**

1. Korotkoff's sounds.	812	—	J06(RS2)
------------------------	-----	---	----------

CHAPTER 94: VENOUS SYSTEM

None

CHAPTER 95: CAPILLARY CIRCULATION**Short Essays**

1. Capillary circulation.	816	358	D05(RS2)
2. What is micro-circulation and explain the pressures in it.	819	—	J09
3. Explain dynamics of capillary fluid exchange. How is it affected in hypo-proteinemia.	819	—	D06(RS2)
4. Describe tissue fluid formation and explain two mechanisms which produce edema.	819	—	J05(RS2)
5. Describe Starlings forces affecting fluid exchange in at capillary level. Explain the role of each force acting across capillaries in tissue fluid formation.	819	—	J07
6. Define edema. Describe mechanism of edema.	820	—	D07

Short Answers

1. Physiological shunt.	—	—	J99
2. List two factors affecting capillary fluid shift.	—	—	J15

Contd...

Contd...

	GKPAL	AKJN	
3. Name two locations of fenestrated capillaries. Specify their function.	817	316	D03
4. Enumerate four factors affecting tissue fluid formation.	819	—	D14

CHAPTER 96: REGULATION OF BLOOD PRESSURE**Long Essays**

1. Define arterial blood pressure. Discuss the factors regulating the blood pressure.	823, 826	349, 351	D14(RS3), J98, D08
2. Define systolic and diastolic blood pressure and give their normal values. Describe the short-term mechanism for regulation of blood pressure.	823, 826	350, 353	D10(RS2), D14
3. Define systolic and diastolic blood pressure and give their normal values. Explain the baroreceptor reflex mechanism for regulation of blood pressure.	823, 829	350, 353	J14(RS3)
4. Define blood pressure, mean arterial pressure and pulse pressure. Discuss the long-term regulatory mechanisms of blood pressure.	823, 837	349, 354	D07(RS2)
5. What is the normal arterial blood pressure? How is it measured and regulated?	823, 811, 826	350, 353	D05(RS2)
6. Describe the role of carotid sinus in the regulation of arterial blood pressure.	829	—	D98

Short Essays

1. Describe the actions of angiotensin II (in regulation of blood pressure).	—	512	D05, D16
2. Define 'mean arterial pressure' and explain the importance of maintaining it.	824	350	D13(RS3)
3. Describe the nervous regulation of blood pressure.	826	353	J12
4. Describe the role of vasomotor center in regulation of arterial blood pressure.	828	331	D10
5. Describe the <u>sinoaortic reflex</u> and its importance.	829	—	J12(RS3), D15(RS3), D02, J03, D04, D06
6. Baroreceptors.	829	332	J08(RS2)
7. Baroreceptor reflexes.	829	334	J06(RS2)
8. Describe the role of baroreceptors in regulation of blood pressure.	829	353	D13

Contd...

Contd...

	GKPAL	AKJN	
9. Describe the role of chemoreceptors in regulation of blood pressure.	833	353	J13
10. Describe how Cushing's reflex is activated and its effect on systemic blood pressure.	833	339	J11(RS2)
11. Describe the role of different hormones in regulation of blood pressure.	836	—	D09
12. Renin-angiotensin system in regulation of blood pressure.	836	355	J06(RS2), D08(RS2), D00
13. Renin-angiotensin-aldosterone axis.	837	—	D07(RS2)
14. Long-term regulation of arterial blood pressure.	837	354	J99, J14

Short Answers

1. Find out mean arterial blood pressure, if systolic pressure is 120 mm Hg and diastolic pressure is 90 mm Hg.	824	350	D10
2. Four factors influencing systolic blood pressure.	824	351	D99
3. Name the arterial baroreceptors. How are they stimulated? Mention two effects of stimulation of baroreceptors.	826	333	D06(RS2)
4. Explain the direct effect of CO ₂ and hypoxia on vasomotor center.	828	332	D10
5. Name the Baroreceptors regulating blood pressure.	829	353	J15
6. Define <u>Marey's law</u> . What is its basis? Mention one condition which is an exception to this.	832	339	D13(RS3), D00, J03
7. Location and innervation of peripheral chemoreceptors.	833	335	J05
8. What is Cushing's reaction? What is its importance? How it restores blood pressure?	833	339	D01, D04, J08, D14
9. What is importance of renin angiotensin mechanism?	836	512	J08

CHAPTER 97: INTEGRATED REGULATION OF CARDIOVASCULAR FUNCTIONS**Short Essay**

1. Draw a labeled graph to show auto-regulation of blood flow. Explain any one mechanism by which it occurs.	842	325	J05
--	-----	-----	-----

Contd...

Contd...

Short Answers

1. Sympathetic and parasympathetic tone.	840	328	J08(RS2)
2. Define autoregulation of blood flow. Mention three theories which explain it.	842	325	J00, J03

CHAPTER 98: REGIONAL CIRCULATIONS**Long Essay**

1. Describe in detail the coronary circulation and the factors influencing it.	848	361	D11
--	-----	-----	-----

Short Essays

1. Describe the characteristic features of cutaneous circulation.	—	378	D13
2. Describe the characteristic features of splanchnic circulation.	—	383	J13
3. Peculiarities of cerebral circulation.	845	—	J17(RS3)
4. Regulation of <u>cerebral circulation</u> (blood flow).	847	369	J07(RS2), J16(RS3), D16(RS3)
5. Describe the mechanism of auto-regulation of cerebral blood flow.	847	370	D09
6. Coronary circulation and its special features.	848	361	J05(RS2), D08(RS2), J15(RS3), J98, D98, D06
7. Give the value of resting coronary blood flow and describe the phasic variation of coronary blood flow during cardiac cycle.	849	363	D11(RS3)
8. Explain the factors influencing coronary circulation (regulation of coronary circulation).	849	364	D00, D01, J03, J12
9. Describe the mechanism of auto-regulation of coronary blood flow.	849	364	D13
10. Role of adenosine in blood flow regulation.	849	365	D08(RS2)
11. Triple response (reaction).	853	379	J08(RS2), D16(RS3), D11

Short Answers

1. Enumerate the factors governing oxygen consumption by the heart.	—	—	D07(RS2)
2. Name two techniques to monitor regional blood flow in the brain.	846	—	D03

Contd...

Contd...

	GKPAL	AKJN
3. List the factors influencing cerebral circulation.	847	369 J00, D05
4. Explain the phasic nature of coronary blood flow.	848	363 D02, D12
5. List four factors influencing coronary blood flow.	849	366 J14
6. What is 'angina pectoris'? Explain the basis of it with a diagram.	850	307 J07(RS2), J99
7. Cutaneous blood flow.	852	378 J07
8. Explain what is 'axon reflex'?	853	330 D15(RS3), J10, J15, D16
*Triple response.	853	379 J06(RS2), D06(RS2), J09(RS2), D14(RS3), J98, J99, J00, D00, J02
10. Write a note on skeletal muscle blood flow.	857	381 D11

■ CHAPTER 99: FETAL CIRCULATION

None

■ CHAPTER 100: PATHOPHYSIOLOGY OF HYPERTENSION AND HYPOTENSION

Short Essay

1. What is meant by Goldblatt hypertension? Explain the underlying mechanism of hypertension. 863 398 D15

Short Answers

1. What is hypertension? What are the causes leading to secondary hypertension? 861 396 J09
2. Physiological basis of a drug in hypertension. 864 — D10(RS2)
3. What is postural hypotension? 865 389 J16(RS3), D16(RS3)

■ CHAPTER 101: PATHOPHYSIOLOGY OF SHOCK

Long Essays

1. Explain the role of arterial baroreceptors soon after blood loss. Name the other compensatory mechanisms available. — 391 J05(RS2)

Contd...

Contd...

	GKPAL	AKJN
2. What is shock? Classify shock. Discuss the various types and physiological basis of treatment.	866	390 J10(RS2)
3. Describe the circulatory changes to moderate blood loss.	867	391 D13
4. Describe the physiological basis of 'irreversible shock'.	868	394 J13
5. Explain the cardiovascular adjustments following: (a) Moderate exercise, (b) Hemorrhage. Add a note on 'irreversible shock'.	1259, 867, 868	482, 394 J07(RS2)

Short Essays

1. Define shock. What are the causes of shock? What is meant by irreversible shock? 866, 868 390 J02, J12
2. List four features of hemorrhagic shock. Explain the basis of any two features. 867 390 J05

Short Answers

1. Classify types of shock. 866 390 D11
2. Mention four compensatory mechanisms in hypovolemic (circulatory) shock. 867 391 D99
3. Explain the mechanism of refractory shock. 868 394 D09
4. Explain what is irreversible shock. 868 394 D10

■ CHAPTER 102: PATHOPHYSIOLOGY OF HEART FAILURE

Short Essay

1. Describe the manifestations of congestive heart failure. 873 394 J10

Short Answer

1. Explain the principles of cardiac resuscitation. — — D13

Section 10: RESPIRATORY SYSTEM

■ CHAPTER 103: FUNCTIONAL ORGANIZATION OF RESPIRATORY SYSTEM

Short Essays

1. Explain nonrespiratory functions of lungs. 884 407 D07
2. Functions of upper respiratory passage. 884 407 J07(RS2), D13(RS3)

Contd...

Contd...

	GKPAL	AKJN
Short Answers		
1. List the functions of nasal cavity.	884	— J01, D01, D04, D14
2. Functions of conducting zone of respiratory tree.	884	407
3. List four nonrespiratory functions of respiratory system.	884	407 J06(RS2), D03
CHAPTER 104: MECHANICS OF BREATHING		
Long Essays		
1. With the help of graphs, explain the mechanism of air entry and exit from the lungs.	891	412 J05(RS2)
2. Describe how expansion of thorax is brought about during eupnea.	891	411 D05, D14
3. Describe the mechanics of respiration. Define lung compliance. Mention two conditions which reduce lung compliance.	891, 894	411, 422 J03, J14
4. Draw a labeled graph to show the lung volumes and capacities and give the normal values of each. Give the significance of volume of air left in lungs after maximal expiration.	893	415 D03
Short Essays		
1. Explain why the alveoli remain dry.	—	420 D06
2. Name the muscles of inspiration and expiration. Explain the role of inspiratory and expiratory muscles in normal respiration.	887	411 D15(RS3), J04
3. Give the nerve supply and functional importance of diaphragm.	887	411 D13(RS3)
4. What is the intrapleural pressure? What are the variations in different phases of respiration?	889	414 J09
5. Draw a graph to show changes in intrapleural pressure during a normal respiratory cycle. Explain the basis of the changes.	890	414 J05
6. Describe the mechanics of breathing. What are the factors necessary in automatic breathing?	891	411 J09, J11, J12
7. Draw a labeled diagram showing subdivisions of lung volume.	893	415 D05

Contd...

Contd...

	GKPAL	AKJN
8. Spirogram.	893	415 J13(RS3)
9. Draw a spiogram indicating various lung volumes and capacities.	893	415 J01, J09
10. Vital capacity.	893	416 D14(RS3)
11. Lung compliance—describe, name factors affecting it, condition where it is increased and decreased.	894	421 D17(RS3), D00, D06, J15
12. Pulmonary surfactant—chemical composition and functions.	899	419 J14(RS3), J15(RS3), D18(RS3)
13. Name the source and chemical nature of lung surfactant. Explain its role in respiration. Indicate the consequences when it is deficient.	899	419 J06(RS2), D98, J00, J01, J02, D05, J11
14. Explain respiratory distress syndrome (hyaline membrane disease). Add a note on 'pulmonary surfactant'.	900	420 D06(RS2), J11(RS2), J06, D16
15. Timed vital capacity and its clinical significance.	903	416 J17(RS3), J03, D14
16. Draw a labeled diagram showing FEV-1 in normal and restrictive conditions.	903	417 J07
Short Answers		
1. Name two muscles each of: (a) Normal respiration, (b) Forced inspiration.	887	411 D10(RS2)
2. What are accessory muscles of inspiration? Name them.	888	413 J05
3. Name the expiratory muscles.	888	413 D03
4. What is normal intrapleural pressure? What is its significance? Draw a labeled graph to depict the intrapleural pressure changes during quiet respiration.	889	414 D98, D10
5. Transpulmonary pressure.	891	— J98
6. Explain the mechanism of ventilation during quiet breathing.	891	411 J13
7. Mention any four lung volumes and its normal values.	892	415 D99
8. Tidal volume	892	415 J18(RS3)
9. Define tidal volume and residual volume. Give their normal values.	892	415 J12(RS3)
10. Define the following giving their normal values: (a) Inspiratory reserve volume, (b) Vital capacity.	892	415 D01, D04

Contd...

Contd...

	GKPAL	AKJN
11. Define 'tidal volume' and 'anatomical dead space'. Give normal values.	892	415, 426 D13.
12. Draw and label different lung volumes and capacities.	893	415 D07
13. Define residual volume and functional residual capacity. Give normal values.	893	415 D09, J14
14. Functional residual capacity (normal value and importance).	893	416 J11(RS2), D13(RS3), J15(RS3), J98, J08
15. Define vital capacity. Give its normal value. Name two physiological conditions where it is decreased.	893	416 D18(RS3), D99, J04, J15
16. Define: (a) Vital capacity and (b) Timed vital capacity.	893, 903	416 D98
17. What is lung compliance? What are its normal values? And in what conditions it is variable.	894	421 D12(RS3), J09, D11
18. Give the source, chemical nature and functions of pulmonary surfactant.	899	419 J08(RS2), D14(RS3), D99, D12
19. Explain respiratory distress syndrome (hyaline membrane disease) with its causes in adults and infants?	900	420 J00, D00, D01, D02, D04, D08
20. Explain factors affecting airway resistance.	902	423 D07, D14
21. Timed vital capacity and its importance.	903	416 D06, J13, D16
22. Forced expiratory volume (FEV ₁)—clinical importance.	903	417 J14(RS3), J98
23. Maximal mid-expiratory flow rate (MMEFR).	904	417 J06
24. Work of breathing.	905	423 J06

■ CHAPTER 105: ALVEOLAR VENTILATION AND GAS EXCHANGE IN LUNGS

Long Essay

1. Describe the factors affecting diffusion of gases at the alveolar capillary membrane. Explain how to determine the diffusion capacity of lungs. 911, 912 429 J10

Contd...

Contd...

Short Essays

- | | GKPAL | AKJN |
|---|-------|------------------------|
| 1. Describe the mechanism of gaseous exchange in the lungs. | — | — J13 |
| 2. Oxygen uptake at lungs. | — | — |
| 3. Dead space (definition, types, measurement). | 907 | 426 J13(RS3), D08(RS2) |
| 4. What is anatomical and physiological dead space? Describe a method to determine anatomical dead space. | 907 | 426 D10 |
| 5. Physiological dead space. | 907 | 426 D18(RS3) |
| 6. Differentiate anatomical and physiological dead space. Describe one method to measure anatomical dead space. | 908 | 426 D00 |
| 7. Describe the factors affecting diffusion of gases through alveolo-capillary membrane. | 911 | 429 J07(RS2) |

Short Answers

1. What is the difference between anatomical and physiological dead space? — D10(RS2)
2. Explain the term 'partial pressure' of a gas and draw a graph to show the value of PO₂ in the: (a) Atmosphere, (b) Alveoli, (c) Arterial blood, (d) Mixed venous blood. 406 J05(RS2)
3. Define "dead space" air and give its importance. Give its normal value. 907 426 J11(RS2), J04, J06
4. What are the types of dead space? Give their normal values. 907 426 J15
5. Physiological dead space. 907 426 D05(RS2), D15(RS3)
6. How is alveolar ventilation calculated? Give the formula. 909 425 D15
7. Calculate alveolar ventilation at a respiratory rate of 12 per minute, tidal volume of 400 mL and dead space air of 100 mL and comment. 909 425 J05
8. Explain alveo-capillary membrane (respiratory membrane) with a labeled diagram. 910 405 J01, J03, J04
9. Normal values for O₂ and CO₂ tensions in air, alveoli and blood. 912 407 J06(RS2)

Contd...

Contd...

	GKPAL	AKJN	
10. Give in a tabular column PO_2 of atmospheric, inspired, alveolar and expired air.	912	407	J12
11. Give the normal partial pressure of oxygen and carbon dioxide in the arterial and venous blood.	912	407	J02

■ CHAPTER 106: PULMONARY CIRCULATION AND VENTILATION. PERFUSION RATIO

Short Essays

- Describe peculiarities (characteristic features) of pulmonary circulation. 915 385 D08, D09
- Define and give examples of ventilation-perfusion ratio. 918 427 D07(RS2), D10(RS2)

Short Answers

- What is pulmonary edema? Name one condition where it is seen. 918 385 J16(RS3)
- Increase of which capillary pressure in pulmonary circulation leads to pulmonary edema and explain the reasons. 918 — J09
- Ventilation-perfusion ratio and its normal value and significance. 918 427 D12(RS3), D17(RS3), D14

■ CHAPTER 107: TRANSPORT OF GASES IN BLOOD

Long Essays

- Explain oxygen transport from the lungs to the tissues. Add a note on oxygen dissociation curve. Write a note on Bohr's effect. 922, 924 434 D15(RS3), J16(RS3), D11
 - Describe oxygen dissociation curve and explain the factors that cause right shift and left shift of dissociation curve. 924, 927 435 D08
 - Describe in detail the various methods of carbon dioxide transport in the blood. What is Haldane's effect? 928, 930 438 D11(RS3), D10
- Short Essays**
- Oxygen transport in the blood. 922 434 J99, J08, J11, D13
 - Describe oxygen dissociation curve with a labeled diagram and factors affecting it. Give the significance of its shape. What is P50? 924 435 D05(RS2), D06(RS2), J07(RS2), D10(RS2), D14(RS3), D16(RS3), J04, J14, D16

Contd...

Contd...

	GKPAL	AKJN	
3. Carbon dioxide transport in the blood.	928	438	J14(RS3), J98, D09
4. In which forms CO_2 is carried in blood? Describe chloride shift.	928	438	D08(RS2), J09(RS2), J12(RS3), D02, D04, D12
5. Describe the carbon dioxide transport in the bicarbonate form.	929	438	
6. Draw 'carbon dioxide dissociation curve'. Explain 'Haldane effect'.	929	439	D12(RS3)
7. Chloride shift.	929	440	D09(RS2), J17(RS3), J10
8. Bohr effect and Haldane effect.	930	435, 439	J15(RS3), J18(RS3)

Short Answers

- Give the volume of carbon dioxide transported in arterial and venous blood. What is the significance of arterial pCO_2 ? 439 J07(RS2)
- Give the normal content of oxygen and carbon dioxide in blood. 437, 439 J04
- Oxygen dissociation curve with a labeled diagram. 924 435 D08(RS2), J00
- Define P50. 925 437 J12
- What are the effects of 2,3-diphosphoglycerate on oxygen-hemoglobin dissociation curve? 926 435 J10
- Explain the role of myoglobin in oxygen transport. 926 436 J10, D10
- List the factors that cause the oxygen dissociation curve to shift to the left. 927 436 D12
- Name the forms in which carbon dioxide is transported in blood. Give its content in arterial blood. 928 438 J15(RS3)
- Chloride shift. 929 440 D18(RS3), J08
- What is Hamburger's phenomenon and where is it taking place? 929 440
- Explain Bohr effect and its physiologic significance. 930 435 D16(RS3), D02, J06, D16
- What is Haldane's effect? Where is it taking place? How is it beneficial? 930 439 J00, J01, J02, J03, J08, J12, J14, D15

Contd...

Contd...

GKPAL AKJN

CHAPTER 108: REGULATION OF RESPIRATION

Long Essays

1. Name the respiratory centers. Explain the neural regulation of respiration. What is apneusis? Add a note on "Ondine's curse". Add a note on 'Hering-Breuer' reflex/add a note on periodic breathing. 932, 943, 444, 447, 958 456 D05(RS2), J12(RS3), D16(RS3), J98, D01, J08, J09, J11, D12, D16
2. What are chemoreceptors? Describe the chemical control of respiration. Add a note on Cheyne-Stokes breathing. 937, 959 449, 456 D12(RS3), D99, J06
3. Give the normal tensions of respiratory gases in arterial and venous blood. Describe in detail chemical control of respiration. 937 449 J05

Short Essays

1. Give the location of respiratory centers. Explain how muscular exercise alters respiration. 932 444 D03
2. Location and functions of centers of respiration. 932 444 D17(RS3)
3. Medullary respiratory centers. 932 444 J14(RS3)
4. Describe the chemical control of respiration. 937 449 J08(RS2), J11(RS2), D06
5. Chemoreceptors. 937 449 J99
6. Name the peripheral chemoreceptors. Where it is present. How it will regulate respiration. 937 449 J02
7. Explain Herring-Breuer inflation reflex. What is its importance? 943 447 D07
8. Cough reflex. 944 448 D08(RS2)

Short Answers

1. What are the functions of pneumotaxic center? 934 445 J15
2. Explain the voluntary control of respiration. 936 446 D09
3. List any four afferents that stimulate respiratory center. 936 447 D98
4. Explain the chemical control of respiration. 937 449 D13

Contd...

Contd...

GKPAL AKJN

5. Herring-Breuer reflexes. 943 447 J06(RS2), J11(RS2), J16(RS3), J12, J15
6. Explain Herring-Breuer inflation reflex. 943 447 D06(RS2)
7. What are 'J' receptors? How are they stimulated and their reflex effects? 943 447 D15
8. What is the importance of cough reflex? 944 — J11

CHAPTER 109: PHYSIOLOGICAL CHANGES AT HIGH ALTITUDE

Long Essay

1. Describe the mechanism of acclimatization to high altitudes. 947 473 J99

Short Essays

1. List the effects of hypoxia at high altitude on body, specifying the mechanism for the change. 947 471 D98
2. Describe changes that occur during acclimatization to high altitude (low PO_2). 948 473 D15(RS3), J00, J08, J11, D11

Short Answers

1. List four changes during acclimatization to high altitude. 948 473 J04
2. Acute mountain sickness. 949 472 J10(RS2)

CHAPTER 110: HYPOXIA AND OXYGEN THERAPY

Long Essay

1. Define hypoxia. Classify hypoxias and explain the features seen in the different types of hypoxia. 950 461 J09(RS2), D13(RS3)

Short Essays

1. Classify and explain 'hypoxia'. Give examples for each type. Mention distinguishing features of each type of hypoxia. Explain the role of oxygen treatment in the different types of hypoxia. 950 461 J06(RS2), D06(RS2), D09(RS2), D10(RS2), D12(RS3), J18(RS3), J02, D02, D04, J15, J17(RS3)
2. Classify hypoxia. Explain any two of them. 950 461 J07
3. Describe the causes and blood gas status of any type of hypoxia. 950 461

Contd...

Contd...

	GKPAL	AKJN	
4. Oxygen therapy.	952	465	J09(RS2)
5. In which type of hypoxia oxygen therapy is most helpful? What are the effects of excess oxygen administration (oxygen toxicity)?	952	465	D15
Short Answers			
1. Two differences between hypoxic and histotoxic hypoxia.	—	465	D16
2. Classify hypoxia (anoxia). Give example for each one of them.	950	461	J10(RS2), J00, J01, J14
3. Define hypoxia. Explain histotoxic hypoxia.	950	461	D07
4. Describe anemic hypoxia.	950	463	D15
5. What is 'stagnant hypoxia'? How does this type of hypoxia affect arterial PO ₂ and oxygen content of blood?	951	463	D12
6. Hyperbaric oxygen.	952	466	J10(RS2)

■ CHAPTER 111: HAZARDS OF DEEP SEA DIVING AND EFFECTS OF INCREASED BAROMETRIC PRESSURE

Short Essay

1. Caissons disease (decompression sickness)—causes, manifestation and treatment. 955 477 J16(RS3), D00, D02, D04, D15

Short Answers

1. What is dysbarism? 955 477 D14(RS3)
2. Caissons disease/decompression sickness. 955 477 D18(RS3), D06

■ CHAPTER 112: RESPIRATION IN ABNORMAL CONDITIONS AND ABNORMAL RESPIRATIONS

Short Essays

1. What is dyspnea, dyspneic index? In what conditions is dyspnea observed? — 455 J09
2. Explain dyspnea and apnea with examples. — 455 D17(RS3)
3. Cyanosis. — 467 J10(RS2), J15(RS3)
4. What is asphyxia? Explain its stages/features (changes occurring). 957 456 D07(RS2), J01, D01, D11
5. Define periodic breathing, and explain its occurrence in various diseases. 958 456 D07(RS2), D14(RS3)

Contd...

Contd...

	GKPAL	AKJN	
Short Answers			
1. How do you differentiate Biot's breathing from Cheyne-stokes breathing?	—	—	J10
2. Deglutition apnea.	—	—	J06
3. Central cyanosis.	—	—	J17(RS3)
4. Apnea.	—	455	J18(RS3)
5. Name any four causes of apnea.	—	455	D98
6. Define dyspnea and apnea.	—	455	J15
7. Dyspnoeic index and its normal value.	—	455	J14(RS3), D14
8. What is cyanosis? How is it produced? What are its types?	—	467	J06(RS2), D11(RS3), J18(RS3), D98, D00, J03, D11
9. Asphyxia and its effects.	957	456	D03, D06
10. Periodic breathing and its types with examples.	958	456	J08(RS2), D08(RS2), J00, J02, J11, J12
11. What is Cheyne-Stokes respiration? Name one condition where it is seen.	959	456	J14(RS3)
12. Explain the features of Biot's breathing. In what pathological conditions is it seen?	959	457	D10

■ CHAPTER 113: ARTIFICIAL VENTILATION AND CARDIOPULMONARY RESUSCITATION

Short Essay

1. Artificial respiration—various method. 961 — D11(RS3), D99, J12

Short Answers

1. What is positive pressure breathing and its application? 961 — D15
2. Artificial respiration—principles, methods. 961 — D16(RS3), J13

■ CHAPTER 114: PULMONARY FUNCTION TESTS

Long Essay

1. Classify and briefly describe pulmonary functions tests in common use. 965 480 J07

Short Essay

1. Lung function tests. 965 480 J08(RS2)

Contd...

Contd...

GKPAL AKJN

Short Answer

1. List lung volumes and capacities. 965 415 J11

Section 11: NEUROPHYSIOLOGY**CHAPTER 115: FUNCTIONAL ORGANIZATION OF NERVOUS SYSTEM****Short Essay**

1. Name the glial cells. Describe their functions. 977 141 D10

Short Answers

1. Draw a cross section of the spinal cord and label the prominent structures. — 895 D06
2. Name the types of neuroglia and mention their functions. 977 141 D99, J00, D02, J03, D12, D16
3. Astrocytes. 977 141 D09(RS2), J13(RS3), D13
4. Microglia. 978 141 D13(RS3)

CHAPTER 116: SYNAPTIC TRANSMISSION IN CENTRAL NERVOUS SYSTEM**Long Essay**

1. Describe the structure of a chemical synapse with a diagram and the steps involved in transmission across such a synapse. Explain any two properties of synapses. 982, 984, 858 987 J08(RS2), D01

Short Essays

1. Compare the mechanism of pre-synaptic inhibition with that of post-synaptic inhibition, with diagrams. — — D99
2. Define and classify synapses. Explain the two properties of synapse (occlusion and subliminal fringe). 981 858 J08
3. Draw and label a synapse. 982 858 J07
4. Explain the steps of synaptic transmission. Name any one inhibitory neurotransmitter substance. 984 859 J13
5. Explain EPSP and IPSP. 986 859 D18(RS3), D14
6. List the properties of synapse. Explain any three properties of synapses. 987 865 D02

Contd...

Contd...

GKPAL AKJN

7. Write a brief note on postsynaptic potential. 988 859 J05
8. Describe the different types of inhibition at the synapse. 988 862 D06, D16
9. What are the types of summation and how are they demonstrated? 989 860 D15
10. Summation and occlusion in synaptic transmission. 989 866 J07(RS2)
11. Explain the differences between muscarinic and nicotinic actions of acetylcholine. 991 1048 D09, J14

Short Answers

1. Explain synaptic fatigue. — 865 J09
2. Synapse. 981 858 D98
3. What is synapse? Mention three types of synapses in nervous system. 981 858 J11
4. What is IPSP and EPSP in the synapse? 986 859 J11
5. Important features of EPSP. 986 859 J14(RS3), D03
6. List four features of synaptic transmission. 987 865 D14
7. List four properties of a synapse. 987 865 D16(RS3), J18(RS3)
8. Synaptic delay. 987 866 D06(RS2)
9. Explain the role of synaptic inhibition. 988 862 J10(RS2), D15(RS3), J18(RS3), J00, D01, J04, D04, D05, D11, D13
10. Explain Renshaw's cell inhibition. 988 863 J04, J08, D09, J14
11. Explain presynaptic inhibition with a diagram. 988 864 J08(RS2), J12
12. Different types of summation in neurons. 989 860 J10(RS2), D12(RS3)
13. Explain the property of synaptic occlusion. 989 866
14. Name the neurotransmitters in the CNS. 990 1047
15. GABA. 992 1051

CHAPTER 117: INTRODUCTION TO SENSORY SYSTEM AND PHYSIOLOGY OF RECEPTORS**Long Essay**

1. Classify sensory receptors. Give examples for each. Explain their properties. 996 870 J11(RS2), D17(RS3), J04

Contd...

Contd...

GKPAL AKJN

Short Essays

- | | | | |
|--|-----------|----------|----------|
| 1. Give the classification of receptors. Describe properties of receptors. | 996 | 870 | D11, D12 |
| 2. Generator potential. | 999 | 873 | D98 |
| 3. Name the cutaneous receptors. How is receptor potential developed? | 1000, 996 | 871 | J11 |
| 4. Properties of sensory receptors. | 1000 | 875 | D12(RS3) |
| 5. Explain adaptation of sensory receptors and its significance with examples. | 1000 | 875 | D05(RS2) |
| 6. Explain the basis of: (a) Intensity discrimination, (b) Localization of stimulus. | 1000 | 874, 876 | D06(RS2) |

Short Answers

- | | | | |
|---|------|-----|------------------------------|
| 1. Classify sensory receptors (axons) and their functions. | 996 | 870 | D05(RS2), J06 |
| 2. Name three touch receptors. Enumerate three properties of them. | 997 | 871 | J16(RS3) |
| 3. Name the thermoreceptors in the skin. | 997 | 872 | D15 |
| 4. Thermal receptors and their location. | 997 | 872 | D06(RS2), J04, J07 |
| 5. Pacinian corpuscle. | 997 | 872 | J07(RS2), D98 |
| 6. Weber Fechner's law. | 1000 | 874 | J11 |
| 7. Explain the mechanism and purpose of 'adaptation' observed in certain sensory 'receptors'. | 1000 | 875 | D13 |
| 8. Explain the "Muller's doctrine" of specific nerve energies. | 1000 | 876 | D08, J11 |
| 9. Law of projection. | 1000 | 876 | J11 |
| 10. What is Phantom limb? Explain law of projection. | 1000 | 876 | D09, J14 |
| 11. Phantom limb and its basis. | 1000 | 876 | D05(RS2), J11(RS2), J98, J02 |

CHAPTER 118: SENSORY COMMUNICATION TO SPINAL CORD**Short Essays**

- | | | | |
|--|---|-----|-----|
| 1. Epicretic and protopathic sensations. | — | — | J99 |
| 2. What are synthetic senses? Give examples. | — | 907 | J05 |

Short Answers

- | | | | |
|---------------------------------------|------|-----|-----|
| 1. Define sensory unit and dermatome. | 1002 | 893 | J08 |
|---------------------------------------|------|-----|-----|

Contd...

Contd...

GKPAL AKJN

- | | | | |
|--|------|---|--------------------|
| 2. What is Bell-Megendie's law? What is the exception to this law? | 1004 | — | D16(RS3), D05, J11 |
|--|------|---|--------------------|

CHAPTER 119: ASCENDING PATHWAYS**Long Essays**

- | | | | |
|---|------------|----------|--------------------|
| 1. Describe the dorsal column tract and its functions. How its functions are affected in <u>Brown Sequard's syndrome</u> . | 1008, 1038 | 895, 938 | J16(RS3) |
| 2. Trace the pathway for touch sensation with the help of diagram. What are the effects of "Tabes dorsalis" on sensory functions? | 1010, 1038 | 895, 940 | D11(RS3), J12(RS3) |

Short Essays

- | | | | |
|--|------|----------|---------------|
| 1. Name the sensory tracts and explain the origin, course and termination of ventral spinocerebellar tract. | 1008 | 895, 897 | J11 |
| 2. Describe the pathway of fine touch with a labeled diagram (dorsal column) from right hand. List other sensations carried by this pathway. | 1008 | 895 | J98, D99, D08 |
| 3. What is Rhombberg's sign and in what diseases this sign is positive? | 1012 | — | D07 |

Short Answers

- | | | | |
|---|------|-----|---------------|
| 1. Explain the effects of unilateral lesion of 'dorsal nerve roots'. | — | — | D13 |
| 2. Explain the origin, course and functions of dorsal spinocerebellar tract. | — | 897 | D09, J14 |
| 3. Name the ascending tracts and sensations carried by them. | 1008 | 895 | J07 |
| 4. Name the tracts in posterior white column of spinal cord. What sensations are carried by these tracts? | 1008 | 895 | J11 |
| 5. Draw the diagram showing dorsal column lemniscal system. | 1008 | 895 | J08(RS2) |
| 6. List the sensations carried by the dorsal column tract. | 1008 | 896 | J05(RS2) |
| 7. Explain stereognosis. | 1011 | 907 | J10(RS2), J02 |
| 8. Dissociated anesthesia. | 1011 | 940 | D07(RS2) |

CHAPTER 120: PHYSIOLOGY OF PAIN, ITCH AND TEMPERATURE**Long Essays**

- | | | | |
|---|------|----------|----------|
| 1. Describe the pain pathway. Write important features of fast and slow pain. | 1014 | 896, 903 | J14(RS3) |
|---|------|----------|----------|

Contd...

Contd...	GKPAL	AKJN
2. Trace the pathways for different types of pain. What are the endogenous pain inhibitory pathways? Write a note on visceral pain.	1016, 1020, 1018	896, 904 D98
3. Draw diagram to show the somatic pain pathways from: (a) Limbs/Soma, (b) Face. Explain the endogenous analgesia system (four ways by which pain sensations can be blocked).	1017, 1025, 1020	896, 904 J05(RS2), D03
4. Draw a neat labeled diagram of 'fast pain' pathway from left lower limb. Explain 'referred pain'.	1017, 1019	896, 904 D13(RS3)
Short Essays		
1. Pathways for fast and slow pain.	1016	— D08(RS2)
2. Describe the neural mechanism of pain. Add a note on acupuncture analgesia.	1016	902 J06
3. Visceral pain.	1018	903 D98
4. Define 'referred pain'. Give any two examples of referred pain. Explain its physiological basis.	1019	904 J07(RS2), J10(RS2), J98, J00, J07, J12, J13, J15
5. Endogenous pain inhibiting system and its role.	1020	904 D07(RS2), J01, J02, D02, D04, J09
Short Answers		
1. Physiological basis of use of a drug in relieving inflammatory pain.	—	— D08(RS2)
2. Briefly describe the differences between fast and slow pain.	—	— D05
3. List four special features of visceral pain.	1018	903 D16
4. Referred pain.	1019	904 J06
5. Describe the mechanism of referred pain.	1019	904 J10
6. Dermatomal theory of referred pain.	1019	904 D07(RS2)
7. Name the endogenous opioid peptides. Mention their role.	1021	906 J13
CHAPTER 121: TRIGEMINAL SYSTEM		
None		

Contd...

CHAPTER 122: THALAMUS**Long Essay**

1. Describe the nuclei, connections and functions of the thalamus with suitable diagrams. Add a note on phantom limb.

Short Essays

1. Describe the functions of thalamus. Add a note on thalamic syndrome.
2. Thalamic syndrome.

Short Answer

1. List the features of thalamic syndrome.

CHAPTER 123: SENSORY CORTEX**Short Essays**

1. Explain the location and functions of somatosensory area of cerebral cortex.
2. Somatosensory area I.

Short Answer

1. Mention the features of representation of the body in the sensory cortex (sensory homunculus).

CHAPTER 124: SENSORY ABNORMALITIES**Short Essay**

1. Brown-Sequard syndrome.

Short Answers

1. Brown-Sequard syndrome—clinical features below the level of lesion.
2. Syringomyelia.

CHAPTER 125: INTRODUCTION TO ORGANIZATION OF MOTOR SYSTEM

None

CHAPTER 126: SEGMENTAL ORGANIZATION OF MOTOR SYSTEM

None

Contd...

GKPAL AKJN

■ CHAPTER 127: MUSCLE SPINDLE AND GOLGI TENDON ORGAN

Long Essays

1. Draw a neat labeled diagram of the muscle spindle. Explain how muscle tone is maintained in the body. 1049 882 D09(RS2), J13(RS3)
2. What are the components of a mono-synaptic reflex? Explain the role of muscle spindle in the regulation of muscle length. 1050 881 D05

Short Essay

1. Describe the structure of muscle spindle and its functions. 1048 881 J10(RS2), D16(RS3), D01

Short Answers

1. Muscle spindle. 1048 881 D10(RS2)
2. Draw and label structure and innervation of muscle spindle. 1049 882 D06(RS2), D08
3. Draw and label Golgi tendon organ. What are its functions? 1052 886 D09, J14

■ CHAPTER 128: SPINAL REFLEXES

Long Essays

1. Give the clinical classification of reflexes. Give examples for each. Draw a labeled diagram of spinal reflex arc. Explain how reflexes are useful in clinical examination. 1055 880 D03
2. Define reflex action. Give different types of classifications of reflexes. Describe four important properties of reflexes. 1059 880 D11

Short Essays

1. Draw the reflex arc for knee jerk. Explain the basis of: (a) Exaggerated knee jerk and (b) Loss of knee jerk. — — D00
2. Importance of clinical testing of muscle tone. — 885 D12(RS3)
3. Reciprocal innervation (neural circuit) and its functional importance. — 886 J01, J15
4. Describe the properties of polysynaptic reflexes. — 887 J05
5. Give the neural circuits for crossed extensor reflex, explain its functional importance. — 887 J03

Contd...

Contd...

GKPAL AKJN

6. How is crossed extensor reflex elicited? Draw a diagram of its neural circuit and mention its purpose. — 888 D15
7. Name the superficial reflexes. What are the physiological conditions in which Babiniski's sign is positive? — 919 D07
8. Stretch reflex. 1054 881 J07(RS2), J09(RS2), J15
9. Draw a diagram of reflex arc and classify reflexes. 1055 880 J11
10. Describe withdrawal reflex with a diagram and give its significance. 1057 887 J08(RS2)
11. Define muscle tone. Explain reflex regulation of muscle tone. 1057 883 J08
12. Define muscle tone. Explain its physiological basis. What is its clinical importance? 1057 885 D99, D00
13. Explain the effect of lesion of a: (a) Dorsal nerve root, (b) Upper motor neuron on muscle tone. 1057 885 D17(RS3)

Short Answers

1. Three differences between superficial and deep reflexes. — — J15(RS3)
2. Draw the reflex arc for patellar tendon reflex. — — J04, J06
3. Draw the reflex arc for knee jerk. — — D05(RS2)
4. Explain reciprocal innervations. — 886 D08
5. What lesions produce patellar clonus and ankle clonus? — 887 D07
6. Draw the neural circuit for crossed extensor reflex. — 888 D13
7. Draw and label a muscle stretch reflex arc. 1055 881 D12
8. Inverse stretch reflex—describe, name the receptors, physiological basis, significance. 1056 886 J17(RS3), J05, J13
9. Explain what is withdrawal reflex. 1057 887 D10
10. Define muscle tone. What is its clinical importance? 1057 885 J00

Contd...

Contd...

GKPAL AKJN

CHAPTER 129: DESCENDING PATHWAYS

Long Essay

1. Describe the origin, course, termination and function of corticospinal tract (pyramidal tract) with labeled diagrams. Describe the role of corticospinal pathways in control of posture and movement. List the effects of lesion of the tract in right internal capsule. What is hemiplegia and paraplegia? List the features of hemiplegia.

1062, 1069
913, 917 J09(RS2),
D15(RS3),
D99, J05,
J09, D09, J14

Short Essays

1. Difference between upper motor neuron and lower motor neuron.
2. Describe the functions of extrapyramidal tracts.
3. (Compare and contrast) Tabulate differences between pyramidal and extra pyramidal systems.
4. Pyramidal tract
5. Describe the course of corticospinal tract. State its functions.
6. Trace the pathway of rubrospinal tract and write its function.
7. In a tabular column compare the features of upper motor neuron lesions and lower motor neuron lesions

J99, J01
917 D11
918 D09(RS2),
J13(RS3)
913 J18(RS3)
913 J10
917 D07
919 D06(RS2),
J11(RS2),
J16(RS3),
J17(RS3)

Short Answers

1. Babinski sign—causes, significance.
2. Upper motor neuron.
3. Mention four features of lesion to corticospinal fibers at right internal capsule level.
4. List the signs of the upper motor neuron lesion.
5. What is hemiplegia and involvement of which motor tract leads to hemiplegia?

919 J06(RS2),
D11(RS3),
J12(RS3),
J18(RS3),
J98, D01,
D04, J10, J12
D98
917 J13
919 D14(RS3),
J00, D02,
D11, J15
917 D07

Contd...

Contd...

GKPAL AKJN

CHAPTER 130: REGULATION OF POSTURE AND MOVEMENT

Long Essays

1. Describe the role of spinal cord and medulla in the control of movement and posture.
2. Describe the immediate effects of complete transection of the spinal cord at midthoracic level and explain the basis of these effects.
3. Describe the neurological changes that are seen four weeks after complete transection of the spinal cord at L-1 level.

Short Essays

1. Explain with the help of a diagram, sensory and motor changes in a hemisection of spinal cord.
2. Tabulate the differences between classical decerebration and ischemic decerebration.
3. Complete transection of the spinal cord.
4. Stages and features of spinal shock.
5. Describe the mass reflex and its basis.
6. Site of lesion and reflexes present in decerebrate cat.
7. Decerebrate rigidity—features and physiological basis/mechanism.
8. Describe the righting reflexes, their significance and neural level of integration.

Short Answers

1. Describe the immediate effects of spinal transection.
2. Spinal shock and its features.
3. Explains mass reflex and its basis.
4. Decorticate rigidity.
5. Describe the functions and the features of primary motor area.

Contd...

	GKPAL	AKJN	
6. Describe the representation on motor homunculus.	1079	912	J05(RS2), D17(RS3), J04

■ CHAPTER 131: BASAL GANGLIA

Long Essay

1. Describe the nuclei, connections and functions of the basal ganglia. Mention the features of basal ganglia lesion. Add a note on its disorders Parkinson's disease (pathophysiology, clinical features, physiological principles of treatment).

Short Essays

1. Enumerate the structures that form basal ganglia. Describe their functions.
2. Nigrostriatal pathway.
3. List four features of basal ganglia disease and explain the basis of any one.
4. Write a short essay on Parkinsonism (cause, clinical features and treatment).
5. Describe the features and physiological basis of Parkinsonism.

Short Answers

1. Differentiate between lead pipe rigidity and cog-wheel rigidity.
2. Paralysis agitans (Parkinsonism) and its features.
3. Explain what is 'lead-pipe' and 'clasp-knife' rigidity in what pathological conditions are they found.
4. Chorea.

■ CHAPTER 132: CEREBELLUM

Long Essays

1. Name the functional divisions of the cerebellum. Describe the structure, connections and functions of cerebellum. Mention two signs of cerebellar lesions.
2. Describe the input, output, internal connections and functions of cerebellum. Add a note on clinical features seen in cerebellar dysfunction.

Contd...

	GKPAL	AKJN	
3. Discuss how cerebellum controls motor activity. Add a note on tests of cerebellar function.	1094, 1096	972, 975	J13
4. List the features of cerebellar disorder. Describe the role of cerebellum in the control of motor functions.	1095, 1094	974, 972	D07(RS2)

Short Essays

1. Functions of spinocerebellum.
2. Name cerebellar nuclei. How is dentate nucleus connected to motor area of cerebral cortex?
3. Describe briefly important connections and functions of neocerebellum (cerebro-cerebellum).
4. Functions of cerebellum.
5. Explain the role of cerebellum in co-ordination of movements.
6. Define muscle tone. Describe supraspinal control of muscle tone.
7. List four features of cerebellar disorders and explain any one.
8. Describe the characteristic features of cerebellar lesion.

Short Answers

1. Explain the functions of flocculonodular lobe.
2. Draw the main connections of neo-cerebellum with cerebral cortex.
3. Alpha-gamma colinkage.
4. Name four features of cerebellar lesions.
5. Adiadochokinesia.

■ CHAPTER 133: VESTIBULAR APPARATUS

Short Essays

1. Vestibular apparatus and its functions.
2. Write briefly on otolith organs.
3. Name the receptors and functions of semicircular canals.

Contd...

Contd...

GKPAL AKJN

Short Answers

1. Enumerate any three functions of vestibular apparatus.	1097	945	J16(RS3)
2. Otolith organs.	1098	943	D18(RS3)
3. Enumerate the functions of semicircular canals, utricle and saccule.	1098	946	D08
4. Post-rotatory nystagmus.	1102	—	D12(RS3)
5. What is vestibulo-ocular reflex?	1102	947	J05

CHAPTER 134: FUNCTIONS OF HYPOTHALAMUS

Long Essays

1. Describe the various nuclei and functions of hypothalamus. Describe the regulation of food and water intake (role of hypothalamus in the perception of hunger and thirst).	1104	1006	D00, D08, J12
2. Describe the principal connections and functions of hypothalamus.	1105	1007	D12(RS3), D13
3. Describe any four functions of hypothalamus. Add a note on anorexia nervosa and hypothalamic obesity.	1106, 1111	1007	J17(RS3)

Short Essays

Describe the functions of hypothalamus.	1106	1007	D09(RS2), J13(RS3), D16(RS3), J06, J07
2. Enumerate the functions of hypothalamus. Describe functions of hypothalamus/in the regulation of: (a) Food intake and (b) Water intake.	1106	1007	D98, J02, D04, J08
3. Explain the role of hypothalamus as an endocrine organ.	1106	1008	D13(RS3)
4. Explain how hypothalamus controls secretion of pituitary gland (mode of hypothalamic regulation of pituitary hormones).	1106	1008	D15
Describe the role of hypothalamus in regulation of temperature.	1107	1008	D07(RS2), J11(RS2)
6. Role of hypothalamus in regulation of food intake.	1107	1009	J15(RS3)
7. Regulation of water balance by hypothalamus.	1110	1011	J14(RS3)

Contd...

Contd...

GKPAL AKJN

Short Answers

1. List any four functions of hypothalamus.	1106	1007	D99
2. Name two areas in hypothalamus which control body temperature.	1107	592	D00
3. Role of hypothalamus in hunger.	1107	1009	J06(RS2)
4. Name the centers that regulate feeding behavior.	1107	1009	D12
5. Circadian rhythm.	1107	1009	D10(RS2), J99
6. What are the locations of osmoreceptors and their functions?	1110	1012	D15

CHAPTER 135: PHYSIOLOGY OF RETICULAR ACTIVATING SYSTEM

Long Essays

1. Describe the nuclei and functions of reticular formation.	1112	961	D07, D13
2. Explain the organization and functions of ascending reticular activating system of brain.	1114	961	D12

Short Essay

1. Describe the functions of reticular activating system.	1112	963	D10
---	------	-----	-----

Short Answer

1. Ascending reticular activating system.	1114	961	J06, J07
---	------	-----	----------

CHAPTER 136: ELECTROENCEPHALOGRAPH AND SLEEP

Short Essays

What is EEG? Discuss the neuro-physiologic basis of EEG? What are its normal waves? What is alpha block? List the changes in EEG during different stages of sleep?	1115	985	D11(RS3), J12(RS3), J16(RS3), J00, D00, J01, J03, J06, J09
2. Define sleep. Describe the genesis of NREM sleep.	1116	988, 990	D09, J14
3. What are the stages of sleep? Write a brief note on REM sleep (mechanisms and features).	1117	989	D05, D14, D15
4. Stages of slow wave sleep.	1117	989	J06(RS2)
5. Compare REM and non REM sleep.	1119	—	D98

Contd...

Contd...

GKPAL AKJN

Short Answers

- | | | | |
|---|------|-----|--------------------|
| 1. Electroencephalogram (EEG). | 1115 | 985 | J18(RS3) |
| 2. Describe the various types of rhythms that make up the electroencephalogram. | 1116 | 985 | D10 |
| 3. Write a brief note on alpha block. | 1116 | 986 | J07(RS2), D05 |
| 4. Define sleep. Explain the characteristic features of REM sleep. | 1116 | 988 | J98, J08 |
| 5. Explain the features of nonrapid eye movement (NREM) sleep. | 1117 | 988 | J12 |
| 6. EEG changes in non-REM sleep. | 1117 | 989 | J14(RS3) |
| 7. Changes during slow wave sleep. | 1117 | 989 | D14(RS3) |
| 8. Differences between REM and NREM (slow wave) sleep. | 1119 | — | D15(RS3), D03, D12 |
| 9. Paradoxical sleep. | 1119 | 989 | J10(RS2) |
| 10. Sleep disorders. | 1122 | 992 | D98 |

CHAPTER 137: LIMBIC SYSTEM**Short Essays**

- | | | | |
|---|------|------|--------------------|
| 1. Limbic system—components and functions. | 1125 | 1028 | J15(RS3), J99, D06 |
| 2. Motivation and addiction. | 1129 | 1031 | J08(RS2) |
| 3. List the features of 'Kluver-Bucy syndrome'. | 1133 | 1025 | D13(RS3) |

Short Answers

- | | | | |
|---|------|------|---------------|
| 1. List the functions of limbic system. | 1129 | 1028 | J00, D02, J03 |
| 2. Mention the effects of bilateral temporal lobectomy. | 1133 | 1025 | J12 |
| 3. Describe Kluver-Bucy animal. | 1133 | 1025 | D11, D14 |

CHAPTER 138: PHYSIOLOGY OF LEARNING AND MEMORY**Short Essays**

- | | | | |
|--|------|------------|----------|
| 1. Define learning. Explain the role of conditioned reflex in learning. | 1134 | 1039 | D09, J14 |
| 2. Give classification of memory. Describe the mechanism of habituation. | 1135 | 1041 | J10 |
| 3. What is conditioned reflex and unconditioned reflex? Explain with an example. | 1136 | 1039 | D00, J03 |
| 4. Describe the molecular mechanisms of learning and memory. | 1137 | 1039, 1042 | D16 |

Contd...

Contd...

GKPAL AKJN

Short Answers

- | | | | |
|--|------|------|----------|
| 1. Habituation and sensitization. | 1135 | 889 | J06(RS2) |
| 2. Types (classification) of memory with examples of each. | 1135 | 1041 | J05 |

CHAPTER 139: PHYSIOLOGY OF LANGUAGE AND SPEECH**Short Essays**

- | | | | |
|--|------|------|----------|
| 1. Name the language areas of cerebral cortex. Mention their location and explain their specific role. Give the features of lesion to these areas. | 1143 | 1037 | J13, D13 |
| 2. Describe the mechanism of speech. | 1144 | 1037 | D10 |
| 3. Discuss the role of Wernicke's area in production of speech. | 1144 | 1037 | J09 |
| 4. How the speech of a person is affected with a lesion in 'Wernicke's area'. | 1145 | 1038 | D17(RS3) |

Short Answers

- | | | | |
|---|------|------|---|
| 1. Dyslexia. | — | — | J08(RS2) |
| 2. Discuss the functions of angular gyrus. | 1144 | — | D10 |
| 3. Broca's area and mention its role in speech. | 1144 | 1037 | D11(RS3), D98, J99 |
| 4. What is aphasia? What are the types? Name the center for speech. | 1144 | 1038 | J11(RS2), J12(RS3), D01, J03, D04, D07, D11 |

CHAPTER 140: ASSOCIATION CORTEX, CEREBRAL ASYMMETRY, LOBES OF THE BRAIN, AND CORTICAL PLASTICITY**Short Essays**

- | | | | |
|--|------|------|--------------------|
| 1. Concept of cerebral dominance (categorization of hemisphere). | 1149 | 1035 | D07(RS2) |
| 2. Mention the various Brodman's (numbers) in the frontal lobe. Describe briefly each one. | 1152 | — | J06 |
| 3. Functions of prefrontal lobe. | 1152 | 1023 | D10(RS2), D13(RS3) |
| 4. What is frontal lobe syndrome and its behavioral effects? | 1153 | 1024 | D11(RS3) |

Short Answers

- | | | | |
|---|------|------|----------|
| 1. Functions of parietal lobe of the brain. | 1151 | 1021 | D08(RS2) |
|---|------|------|----------|

Contd...

Contd...	GKPAL	AKJN	
2. Functions of prefrontal lobe.	1152	1023	J04, D06, J10
3. Mention two effects of prefrontal lobotomy.	1153	1024	D12

CHAPTER 141: CEREBROSPINAL FLUID

Long Essay			
1. Describe the mechanism of secretion, circulation and functions of cerebrospinal fluid.	1156	373	D10(RS2), J10
Short Essay			
1. Describe formation, circulation and function of cerebrospinal fluid (CSF). Add a note on hydrocephalus.	1156	373	J18(RS3), D15

Short Answers			
1. Cerebrospinal fluid and its functions.	1154	372	J09(RS2), J15(RS3), J02, J04, J05
2. Mention the site of production, drainage and method of collection of cerebrospinal fluid (CSF).	1156	373	J13
3. Lumbar puncture (sites and uses).	1158	374	J99, D03
4. Explain blood-brain barrier in cerebral circulation.	1160	375	J09

Section 12: SPECIAL SENSES

CHAPTER 142: FUNCTIONAL ANATOMY OF EYE

Long Essay			
1. Describe the formation, circulation, drainage and functions of aqueous humor. What is glaucoma?	1168	1090	J03
Short Essays			
1. Draw a diagram to show the different refractive media of the eye and explain their role in the dioptric power of the eye.	—	—	D05(RS2)
2. Describe the sources, circulation, drainage and functions of aqueous humor. Draw a diagram to show the circulation of aqueous humor. Give the significance of regulation of intraocular pressure.	1168	1090	J05(RS2), D14(RS3), J17(RS3), D99, J04
3. Importance of maintaining normal intraocular pressure.	1171	—	D17(RS3)

Contd...

Contd...	GKPAL	AKJN	
----------	-------	------	--

Short Answers

1. Describe the mechanism of constriction and dilation of pupil.	1167	—	J12
2. Name the intraocular muscles, with their functions.	1168	1088	D99
3. Functions, circulation, absorption of aqueous humor and its applied aspect.	1168	1090	J15(RS3), J99, J02, J08, J15, D15
4. Glaucoma.	1168	1090	D12(RS3)
5. What is fovea centralis and why it has highest visual acuity?	1170	1089	D15, D16
6. Importance of fovea centralis.	1170	1090	J15
7. Amacrine and horizontal cells.	1170	1092	D09(RS2), J13(RS3)
8. What is the normal intraocular pressure? What is the clinical importance?	1171	—	J11(RS2), D01, D02, D04
9. What is the location and cause for physiological blind spot in visual field.	1171	1089	D01, D04, J08
10. What is the normal intraocular pressure? How is it measured? Define glaucoma.	1171	1090	D11(RS3)

CHAPTER 143: IMAGE-FORMING MECHANISM

Short Essays

1. Describe the errors of refraction and their correction.	1175	1105	D07(RS2), D10(RS2), J11(RS2), J12(RS3), J14(RS3), D18(RS3), D01, J08, D11
2. Draw diagram to show the formation of images in hypermetropia, myopia and astigmatism. Explain its correction.	1175	1105	D06(RS2), D03

Short Answers

1. What are Purkinje Samson images? What do they demonstrate?	—	1100	J00, J01
2. Accommodation in eye.	1174	1100	J06(RS2)
3. Changes during accommodation for near vision (components of near response).	1174	1102	J12(RS3), D05, D07
4. Define near point. Give its clinical significance.	1174	1103	D14(RS3)

Contd...

Contd...	GKPAL	AKJN
5. Myopia.	1175	1105
6. Hypermetropia—image formation and its correction (with help of a diaphragm).	1175	1105
7. Depict by means of sketches refractory errors in myopia and hypermetropia and their correction.	1175	1105
8. What is astigmatism? Explain the basic defect in astigmatism. How is it corrected?	1175	1106
9. Presbiopia and its correction.	1176	1105

■ CHAPTER 144: PHOTORECEPTOR MECHANISM

Short Essays

1. Distinguish between the functions of rods and cones. Explain how rhodopsin—retinene cycle.	—	—	D06
2. Visual pigments.	1178	1108	D12(RS3)
3. Describe the sequence of events in the photoreceptors when light strikes them.	1178	1108	J12
4. Describe the sequence of events in phototransduction in rods and cones.	1178	1110	D08
5. Describe the genesis of photoreceptor potential in rods.	1178	1111	D14
6. Explain the ionic basis of photoreceptor potentials.	1178	1111	D08

Short Answers

1. Differentiate rods from cones.	—	—	J16(RS3)
2. What is scotopic and photopic vision? What is Purkinje phenomenon?	—	1106	D09, J14
3. Name the retinal receptors of vision (visual receptors). What are their functions?	1177	1091	D13(RS3), J00, D00, J01, D07, D14
4. Name functions of rods and cones.	1177	1091	D10(RS2)
5. Draw flowchart of rhodopsin—retinal visual cycle.	1179	—	D11

■ CHAPTER 145: VISUAL PATHWAY AND VISUAL CORTEX

Long Essay

1. Describe the optic pathway. What are the effects of lesions at various levels of the optic pathway?	1181	1093, 1097	J06
--	------	------------	-----

Contd...

Contd...	GKPAL	AKJN
----------	-------	------

Short Essays

1. Describe visual pathway with a labeled diagram. Describe the effects of lesions at various levels in the pathway.	1181	1093, 1097	J07(RS2), J10(RS2), D15(RS3), J18(RS3), J98, J10
2. Draw a labeled diagram of the visual pathway. Name the field defect produced by cutting the left optic tract and indicate it on a diagram.	1182	1094, 1097	D03
3. Draw the visual pathway. Explain homonymous hemianopia and macular sparing.	1182	1094, 1096	J05(RS2)
4. Name the different visual field defects caused by lesions to visual pathway. Give the basis of each defect. What is 'macular sparing'?	1182	1097	J13

Short Answers

1. What is homonymous hemianopia? Mention the lesions in the visual pathways that produce it.	—	1096	D10
2. Bitemporal hemianopia.	—	1096	D12(RS3)
3. Macular sparing.	—	1098	D09(RS2), J13(RS3)
4. Draw a visual pathway.	1182	1094	J15(RS3)
5. What is the effect of lesion in visual pathway at the level of optic chiasma?	1182	1097	J05

■ CHAPTER 146: VISUAL ACUITY, VISUAL FIELD, LIGHT AND DARK ADAPTATIONS, AND VISUAL REFLEXES

Long Essay

1. Describe the pupillary reflexes and their pathways. Add a note on Argyll-Robertson pupil.	1191	1100, 1103	D15
--	------	------------	-----

Short Essays

1. What is meant by visual acuity? What are the factors that influence visual acuity? Explain the physiological basis of testing visual acuity.	1188	1100	D02, J08, D12
2. Describe the mechanism of light and dark adaptation.	1190	1109	D08

Contd...

Contd...	GKPAL	AKJN	
3. Dark adaptation—explain with help of a diagram, time course and changes occurring, factors contributing.	1191	1109	D06(RS2), J10(RS2), J17(RS3), D00, J02, D04, J05, J09
4. Dark adaptation and nyctalopia.	1191	1109, 1110	J16(RS3)
5. Light and accommodation reflexes (pupillary reflex).	1191	1100	J09(RS2)
6. Explain pupillary light reflex. Describe the pathways involved in it.	1191	1100	D10
7. Draw the pathway for 'indirect light reflex'.	1192	1102	D13(RS3)
8. Draw a diagram to show the pathways for light reflexes (no explanation needed).	1192	1102	D06(RS2), D05
9. Accommodation reflex—trace the pathway and explain the changes occurring during accommodation. What is Argyll-Robertson's pupil?	1192	1103	D09(RS2), J13(RS3), J17(RS3), J01, J07
10. Describe the mechanism of accommodation. Draw and label accommodation pathway (near response).	1174, 1192	1102	J15(RS3), J04

Short Answers

1. Define: (a) Visual acuity and (b) Accommodation	1188, 1174	1100	D99
2. Visual acuity—define, basis, expression.	1188	1100	J01, J05, D05
3. What is field of vision? What are the limits of field of vision in different meridians?	1189	1096	J02
4. Describe the dark and light adaptation.	1190	1109	D11
5. Dark adaptation—physiological basis, three mechanism involved, dark adaption curve, related disorder.	1191	1109	J14(RS3), J98, J13
6. What is nyctalopia? Give its physiological basis.	1191	1110	D13
7. Accommodation reflex (near response of eye).	1191	1103	J07(RS2), D98, J99, D09, J14, J15
8. What is Argyll-Robertson's pupil? Name site of lesion producing it.	1192	1103	D00, D02

CHAPTER 147: COLOR VISION**Long Essay**

1. What are the mechanisms to perceive color vision (theories of color vision)? Add a note on color blindness (classification and tests).	1194	1115	J06(RS2)
---	------	------	----------

Contd...

Contd...

Short Essays

1. Color vision.	1194	1114	J98
2. Theories of color vision (Mechanisms of color vision).	1194	1115	D08(RS2), D16
3. Describe the Young-Helmoltz theory of color vision.	1194	1115	D10
4. Describe color blindness.	1195	1115	J12(RS3), D15(RS3)
5. Define and classify color blindness. What is the peculiarity of inheritance of color blindness?	1195	1115	J00, J02, D04

Short Answers

1. Explain primary and complementary colors.	1193	1114	J10
2. Explain briefly trichromatic theory of color vision?	1194	1115	D99, J06
3. Color blindness.	1195	1115	D06

CHAPTER 148: MOVEMENTS OF THE EYE**Short Answers**

1. Strabismus.	—	—	J07
2. Describe the innervation and movements of extraocular muscles.	1199	1118	D08
3. Mechanism of depth perception of object by the eyes.	1200	—	J08(RS2)

CHAPTER 149: FUNCTIONAL ANATOMY AND FUNCTIONS OF THE EAR**Short Essays**

1. Attenuation reflex.	—	1076	J07
2. Describe the structure, contents and functions of middle ear. Explain the tympanic reflex (impedance matching).	1202, 1204	1069, 1076	D09(RS2), J11(RS2), J12(RS3), J13(RS3), D15(RS3), J16(RS3), D17(RS3), J00, D06, J12, D16
3. Describe briefly the functions of middle ear.	1204	1075	J10(RS2), J18(RS3), D18(RS3), D98, D99, D12

Contd...

Contd...

	GKPAL	AKJN	
4. What are types of deafness? Give an example for each.	1217	1081	D14
5. Conduction deafness.	1217	1081	D98
6. Rinne's test and its interpretation.	1218	1083	D07(RS2), J01
7. Explain Weber's test and its application.	1218	1083	D00, D01, D04, D10
8. What is meant by audiometry?	1219	1082	J03, J12, D12

CHAPTER 153: PHYSIOLOGY OF SMELL

Short Essays

1. Primary sensation of smell.	—	—	J07
2. Neural pathway and the physiological role of olfaction.	1221	1058	D13(RS3)
3. Describe with the help of a diagram, the olfactory pathway (pathway for smell). Explain the term adaptation in relation to olfaction.	1221	1058	J09(RS2), D02, D03, J12

Short Answers

1. Name any two special features of olfactory sensation.	1220	1061	D15
2. Mention the location of olfactory receptors. What is olfactory adaptation?	1221	1058	J13
3. Olfactory bulb.	1221	1058	J98
4. Draw and label basic neural circuits in olfactory bulb.	1221	1058	D08
5. Name the cortical olfactory areas.	1221	1059	D14(RS3)
6. Draw and label olfactory pathway.	1222	1058	J11(RS2), J14(RS3), J15
7. List the factors affecting olfaction.	1223	—	D16
8. What are anosmia and hyposmia? Mention any common cause.	1223	1061	D15

CHAPTER 154: PHYSIOLOGY OF TASTE

Short Essays

1. Describe the structure of taste bud, the location of taste buds and the taste pathway.	1224	1063	D11(RS3)
---	------	------	----------

Contd...

Contd...

	GKPAL	AKJN	
2. Describe the taste pathways and mechanism of taste perception.	1225	1064	D12(RS3), J15(RS3), J00, D00, J03, D06, J09, D11, D14
3. Taste pathway and taste disorders.	1225	1064	D18(RS3)
4. Name the primary taste sensations. Give the role of chemical senses in humans.	1225	1065	J04
5. Draw a diagram to show the taste pathway from the anterior two-thirds of the tongue.	1226	1064	D05(RS2)
6. Mention the basic modalities of taste sensation and their representation on the tongue. Describe a taste bud.	1226	1065	D01

Short Answers

1. Taste buds.	1224	1063	J10(RS2), J18(RS3), J99
2. Mention the nerve supply of the tongue which carries the general sensations and taste sensations from different areas of the tongue.	1225	1064	D02
3. Name basic taste sensations. On what part of the tongue they are perceived.	1225	1065	J10
4. Name the primary taste sensation. Explain the mechanism of perception of any one taste sensation.	1225	1065	D17(RS3)
5. Name the primary taste sensations. What is aguesia.	1225	1065	J11(RS2), D14(RS3), D12
6. Draw taste pathway from anterior 2/3rd of tongue to the cortex.	1226	1064	J16(RS3)
7. Draw a labeled diagram of pathways for taste.	1226	1064	D10(RS2), D15(RS3), D99, J02, J03, D10
8. What is aguesia? Trace the pathway of taste upto the taste center?	1228	1067	D07

Contd...

Contd...

GKPAL AKJN

Section 13: INTEGRATIVE PHYSIOLOGY

■ CHAPTER 155: STRUCTURE AND FUNCTIONS OF THE SKIN

Short Essay

- | | | | |
|--|------|-----|---------------|
| 1. Explain briefly the role of skin in regulation of body temperature. | 1236 | 590 | D10(RS2), J15 |
|--|------|-----|---------------|

Short Answers

- | | | | |
|---|------|-----|---|
| 1. Draw and label the structure of skin. | 1233 | — | J07 |
| 2. Sweat gland. | 1234 | 591 | J09(RS2), D10(RS2), D03 |
| 3. Name the different types of sweat glands and give the stimulus for each. | 1234 | 591 | D17(RS3), D08 |
| 4. Eccrine sweat glands—distribution and functions. | 1234 | 591 | J12(RS3), D14(RS3), D98, D99, D02, J03, D06, D09, J11, J13, D13, J14, D14 |
| 5. Functions of skin. | 1236 | — | D11(RS3) |
| 6. What are the secretory and synthetic functions of skin? | 1236 | — | D11 |
| 7. Describe the functions of skin in regulation of body temperature. | 1236 | 590 | |

■ CHAPTER 156: REGULATION OF BODY TEMPERATURE AND ACCLIMATIZATION TO HOT AND COLD ENVIRONMENTS

Short Essays

- | | | | |
|--|------------|----------|---------------|
| 1. How much is normal body temperature and explain the various heat gain mechanisms. | 1238, 1240 | 587, 588 | J11 |
| 2. What is core and shell temperature? Explain heat loss mechanisms. | 1238, 1241 | 587 | J15(RS3) |
| 3. Regulation of body temperature. | 1240 | 591 | J18(RS3) |
| 4. Explain the heat loss mechanisms to maintain constant body temperature. | 1241 | 590 | J07(RS2), D07 |
| 5. Role of conduction type of heat loss in treating heat stroke. | — | 590 | J08(RS2) |
| 6. Mechanisms activated in body with exposure to heat. What is heat stroke? | 1245 | 592 | J14(RS3) |
| 7. Immediate cardiovascular changes on exposure to hot climate. | 1245 | 592 | D07(RS2) |

Contd...

Contd...

GKPAL AKJN

- | | | | |
|--|------|-----|----------|
| 8. How is body temperature defended when a person is exposed to very cold environment? | 1246 | 591 | J15 |
| 9. Body mechanisms activated with exposure to cold. | 1246 | 591 | J16(RS3) |
| 10. Cardiovascular changes on exposure to cold. | 1248 | 591 | D08(RS2) |
| 11. Hypothermia. | 1251 | 594 | J98, J99 |
| 12. What is hypothermia and what is the clinical importance of induced hypothermia? | 1251 | 594 | D07 |

Short Answers

- | | | | |
|---|------------|----------|-----------------------------------|
| 1. Role of horripilation. | — | 591 | D03 |
| 2. Explain how behavioral thermoregulation operates to maintain body temperature. | — | — | J09 |
| 3. What is normal body temperature? What is the role of skin in maintaining it. | 1238, 1236 | 587 | J01 |
| 4. What is the normal body temperature? Enumerate the bodily reactions that tend to prevent a rise in body temperature. | 1238, 1245 | 587, 590 | J02 |
| 5. What is the normal body temperature? What are the means of heat loss from the body? | 1238, 1241 | 587, 590 | D02 |
| 6. Explain the factors affecting body temperature. | 1238 | 588 | J08 |
| 7. What is the normal "core body temperature"? Mention the ways in which the body can gain heat. | 1238, 1240 | 587 | D01, D04 |
| 8. Core and shell temperature. | 1238 | 587 | D10 |
| 9. List the different modes of heat production in the body. | 1240 | 588 | D99 |
| 10. Explain the heat loss mechanisms. | 1241 | 590 | D13(RS3), J17(RS3), J00, J03, J08 |
| 11. Explain how sweating helps in temperature regulation. | 1242 | 591 | D05(RS2), J04, D06 |
| 12. How does sweating help in regulating body temperature? Give the innervation of eccrine sweat glands. | 1242 | 591 | D12 |
| 13. What is the role of epinephrine on thermogenesis? | 1244 | 593 | D16 |

Contd...

Contd...	GKPAL	AKJN	
14. Name the hypothalamic centers that regulate body temperature. Mention the role of hypothalamus in the causing fever.	1244	592	J13
15. Explain the mechanism of temperature regulation by anterior hypothalamus.	1244	592	D10
16. Explain the role of hypothalamus in thermoregulation in cold environment.	1244	591	J12
17. What are the physiologic thermoregulatory mechanisms activated by an increase in body temperature or exposure to heat?	1245	592	D01, D04, J05, D08
18. Brown fat—functions.	1246	589	J07(RS2), D15
19. Enumerate the thermoregulatory changes when a person is exposed to 20 degree centigrade.	1246	591	D13
20. How is body temperature defended when a person is exposed to very cold environment?	1246	591	D05, J10, D14
21. Explain the role of shivering in temperature regulation.	1246	591	J05(RS2)
22. Nonshivering thermogenesis.	1246	—	D12(RS3)
23. What is pyrexia? Explain the physiological basis of its genesis.	1248	593	J12
24. Describe pathogenesis and functions of fever.	1249	593	J10, D12
25. Endogenous pyrogens.	1249	594	D09(RS2), J13(RS3)
26. Heat stroke—explain (symptoms and treatment).	1250	—	J09, D09, J14
27. Describe the effects and use of hypothermia.	1251	594	D11

■ CHAPTER 157: PHYSIOLOGY OF EXERCISE AND SPORTS SCIENCE

Long Essay

1. Describe the cardiorespiratory adaptations to exercise. 1256, 1259 482 D09

Short Essays

1. Describe the cardiovascular and respiratory adjustments during exercise. 1256 482 J06, J10
2. Explain the changes which occur in the respiratory system during muscular exercise. 1256 486 J05(RS2)
3. Describe the oxygen debt mechanism. 1256 487 D08

Contd...

Contd...

	GKPAL	AKJN	
4. Describe the cardiovascular changes during muscular exercise.	1259	482	J12(RS3)
5. Describe the circulatory changes during muscular exercise.	1260	484	J00, J01, D01, J04
6. Describe the effect of muscular exercise on coronary blood flow.	1261	366	D05

Short Answers

1. Oxygen debt. 1256 487 J06
2. Diagrammatically represent the ventilatory changes during exercise. 1257 486 J09(RS2)
3. Describe the effects of dynamic exercise on muscle blood flow. 1260 484 J07
4. Why do heart rate and rate of respiration increase during exercise? 1260, 1257 482, 486 J09

■ CHAPTER 158: PRINCIPLES OF ACID-BASE HOMEOSTASIS

Short Essays

1. Renal regulation of H⁺ ion. 1268 557 J10(RS2)
2. Outline the role of kidneys in acid-base balance. Add a note on tubular buffers. 1268, 713 557 D12, D13
3. Enumerate the causes of metabolic acidosis. How is it corrected? 1269 569 D07
4. Renal compensation in respiratory acidosis. 1270 569 D05(RS2)

Short Answers

1. What is the pH value of arterial and venous blood? Name one physiological and one abnormal condition producing alkalosis. 1266 569 J07
2. Bicarbonate buffer system. 1267 566 D08(RS2)
3. Metabolic acidosis. 1269 571 J08(RS2)

■ CHAPTER 159: REGULATION OF VOLUME, COMPOSITION AND OSMOLALITY OF BODY FLUID COMPARTMENTS

None

■ CHAPTER 160: PHYSIOLOGY OF GROWTH AND DEVELOPMENT

Long Essays

1. Give a detailed account of physiology of growth and development in human beings. 1278 674 J98
2. Describe in detail endocrine regulation of growth. 1279 677 J04

Contd...

Contd...

	GKPAL	AKJN
Short Essay		
1. Describe the mechanism by which hormones regulate growth.	1279	677 D06
Short Answer		
1. What is Lorain dwarfism and its causes?	1281	672 D15
■ CHAPTER 161: PHYSIOLOGY OF NUTRITION		
Short Essay		
1. Dietary fiber.	1283	636 J09(RS2)
Short Answers		
1. What is respiratory quotient and the effect of metabolism of various food stuffs on its value.	—	— D11(RS3)
2. What is dietary fiber? What is its importance?	1283	636 D18(RS3), D08, D09
■ CHAPTER 162: PHYSIOLOGY OF AGING AND OXIDATIVE STRESS, PREVENTION OF AGING AND PHYSIOLOGY OF YOGA		
None		
■ MISCELLANEOUS		
Long Essay		
1. Discuss the hypothalamo-hypophyseal control of ovulation and spermatogenesis..	—	— D06
Short Essays		
1. Define 'pitting edema'. Give its physiological basis.	—	— J13
2. Explain the role of 'chemical senses' in humans.	—	— J05(RS2)
3. Problems in prematurity.	—	— J08(RS2)
4. Smell and taste are linked—explain.	—	— D09(RS2), J13(RS3)
5. Reactive hyperemia.	—	— J10(RS2)
Short Answers		
1. AS paintal.	—	— J06
2. Alkaline tide.	—	— J08(RS2), D08(RS2)
3. Factors causing hypo-effective heart.	—	— D08(RS2)
4. What is translocation blood and when is it taking place in a normal subject?	—	— J09

Contd...

Contd...

	GKPAL	AKJN
5. Physiological basis of use of a drug in the treatment of stroke.	—	— D08(RS2)
6. Enumerate the types of RNA and explain their functions.	—	— J11
7. What is reactive hyperemia? Where does it occur?	—	— D10
8. Mention the methods of cells division with examples. Where it takes place?	—	— D99
9. What is meant by mitosis and meiosis? Where does it take place?	—	— J02
10. What is meant by translation and transcription process?	—	— D01, J03, D04
11. What are the causes for latent period in simple muscle twitch?	—	— D15
12. What is alveolar capillary block syndrome?	—	— J09(RS2)
13. Enumerate the functions of medulla oblongata.	—	— J08
14. Name some abnormal involuntary movements and the sites of lesion.	—	— D15
15. In which conditions tremors are observed and how they are differentiated?	—	1000 D11(RS3)
16. Discuss papilledema.	—	375 J08(RS2)
17. Positive 'G'.	—	389 D08(RS2)
18. Carbon monoxide poisoning.	—	463 J13(RS3)
19. What is transferrin?	—	55, 272 J15
20. Name any two types of abnormal gaits. Mention the diseases associated with them.	1086, 1095	919, 975, D02 1001

3

BIOCHEMISTRY

REFERENCES

1. U. Satyanaran, U Chakrapani (**STNRN**): Biochemistry (5th Edition), Elsevier Health Sciences, New Delhi, ₹ 1365/-
2. DM Vasudevan, Sreekumari S, Kannan Vaidyanathan (**VSDN**): Textbook of Biochemistry (For Medical Students) (8th Edition), Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, ₹ 995/-

COURSE CONTENTS**THEORY**

- I. Introduction and scope of biochemistry
- II. Cell and subcellular structures
 - a. Cell membrane—composition
 - b. Functions of subcellular structures.
 - c. Transport across the cell membrane
 - i. Active transport
 - ii. Facilitated diffusion
 - iii. Receptor-mediated transport
 - iv. Endocytosis.
- III. Acid-base imbalance
 - a. Hydrogen ion concentration, acids, bases, buffers, Henderson-Hasselbach equation.
- IV. Isotopes, radioactive isotopes and their application in medicine
- V. Chemistry of carbohydrates
 - a. Definition, classification and biological importance.
 - b. Monosaccharides: Structure, classification and properties—*isomerism*.
 - c. Stereoisomerism
 - d. Oligosaccharides: Disaccharides—structure and their importance.
 - e. Polysaccharides: Homo- and heteropolysaccharides—structure and their functions.
- VI. Chemistry of proteins, amino acids and peptides
 - a. Proteins: Definition, classification and functions.
 - b. Amino acids: Classification, properties, side chains of amino acids, charge properties.
 - c. Peptides: Biologically important peptides—GSH, insulin and structure.
 - d. Structural organization, conformation and denaturation.
- VII. Chemistry of lipids
 - a. Definition, classification and biological importance.
 - b. Simple lipids: Triacylglycerol and waxes—structure and composition.
 - c. Compound lipids: Phospholipids, sphingolipids, glycolipids and their composition and function.
 - d. Derived lipids: Fatty acids—saturated and unsaturated and their properties, eicosanoids, terpenes.
- VIII. Chemistry of nucleic acids
 - a. Definition, biological importance.
 - b. Classification and composition.
 - c. Purine and pyrimidine bases, nucleosides, nucleotides and biologically important nucleotides.
 - d. DNA: Structure and functions.
 - e. RNA: Types of RNA—structure and functions.
- IX. Enzymes and clinical enzymology
 - a. Definition, classification, specificity, coenzymes, cofactors activators.
 - b. Mechanism of enzymes action.
 - c. Factors affecting enzymes activity— K_m value and its importance.

- d. Enzyme inhibition: Reversible and irreversible, competitive and other types, in clinical application.
- e. Regulatory enzymes: Proenzymes or zymogen, isoenzymes, allosteric enzymes and feedback control.
- f. Diagnostic and therapeutic importance of enzymes including enzyme immunoassay.
- g. ELISA and RIA.
- X. Vitamins
 - a. Definition and classification.
 - b. A brief account of chemistry, source, deficiency diseases and biochemical role, recommended dietary allowances (RDA).
 - c. Vitamin antagonists.
 - d. Hypervitaminosis.
 - e. A brief account of role of antioxidants and free radicals.
- XI. Biological oxidation
 - a. Mitochondria electron transport chain, oxidative phosphorylation, mechanism, uncouplers and inhibitors.
- XII. Digestion and absorption from gastrointestinal tract
 - a. Digestion and absorption of carbohydrates, lipids, proteins and nucleic acids.
 - b. Malabsorption syndromes.
- XIII. Carbohydrates metabolism
 - a. Glycogenesis, glycogenolysis and glycogen storage disease.
 - b. Glucose transporters, glycolysis, Rapoport-Luebering cycle, pyruvate oxidation, citric acid cycle.
 - c. Pentose phosphate pathway.
 - d. Uronic acid pathway.
 - e. Gluconeogenesis and Cori's cycle.
 - f. Metabolism of fructose and galactose.
 - g. Regulation of metabolic pathways.
 - h. Disorders of carbohydrates metabolism.
 - i. Regulation of blood sugar, glucose tolerance test, diagnostic and prognostic importance of glycated hemoglobin and diabetes mellitus.
- XIV. Lipid metabolism
 - a. Oxidation of fatty acids, propionate metabolism, formation and utilization of ketone bodies, ketosis, outline the synthesis of cholesterol (reactions up to mevalonate in detail), breakdown of cholesterol and metabolic disorders of lipids.
 - b. Lipogenesis, de novo synthesis of fatty acids, chain elongation, desaturation, phospholipid biosynthesis (lecithin and cephalin only) and their breakdown.
 - c. Fatty liver and lipotropic factors.
 - d. Prostaglandins and their biological functions.
 - e. Plasma lipoproteins—classification, functions and disorders.
- XV. Protein and amino acid metabolism
 - a. Breakdown of tissue proteins and amino acid pool, general reactions of amino acids.
 - b. Disposal of ammonia: Urea cycle, glutamate and glutamine formation.

- c. Metabolism of individual amino acids (glycine, serine, sulfur-containing amino acids, aromatic amino acids, histidine and arginine).
- d. Metabolic disorders of amino acids, aminoacidurias.
- e. Synthesis of creatine, phosphocreatine, formation of creatinine and clinical significance of creatinine clearance.
- XVI. Purine and pyrimidine metabolism
 - a. Source of various atoms of purine and pyrimidine, biosynthesis of purine and pyrimidine nucleotides and their breakdown.
 - b. Salvage pathways.
 - c. Disorders of purine and pyrimidine metabolism.
- XVII. Intermediary metabolism
 - a. Introduction, methods of study of intermediary metabolism.
- XVIII. Minerals
 - a. Calcium, phosphorous, sodium, potassium, chlorides, iron, copper, iodine, zinc, fluoride, magnesium, manganese and selenium.
- XIX. Molecular genetics and protein biosynthesis
 - a. DNA, RNA metabolism.
 - b. Replication, transcription, reverse transcription and post-transcriptional modifications.
 - c. Translation—amino acid activation, initiation, elongation and termination, post-translation modifications.
 - d. Regulation of gene expression.
 - e. Mutations.
 - f. Recombinant DNA technology, PCR and gene therapy.
- XX. Tissue biochemistry
 - a. Heme metabolism: Outline of heme biosynthesis, degradation of heme and functions of normal hemoglobin.
 - b. Abnormal hemoglobin.
 - c. Jaundice.
 - d. Porphyria.
 - e. Plasma proteins: Separation, functions and importance.
 - f. Immunoglobulins: Structure and functions.
 - g. pH of blood, its regulation, acidosis, alkalosis, principles of estimation of body fluids, role of kidneys and lungs in blood pH maintenance.
- XXI. Liver functions and kidney functions
 - a. Liver function tests, kidney function tests.
 - b. Detoxification, mechanisms and metabolism of xenobiotics.
- XXII. Nutrition and energy metabolism
 - a. BMR and its importance.
 - b. Calorific values of food, RQ, SDA, balanced diet.
 - c. Protein energy malnutrition, biological value of proteins, nitrogen equilibrium.
 - d. Dietary fibers.
 - e. Biochemistry of starvation.
- XXIII. Biochemistry of cancer
 - a. Oncogenes.
 - b. Growth factors.

c. Tumor markers

- i. Definition
- ii. Clinically important tumor markers—CEA, alpha fetoprotein (AFP).
- iii. Human chorionic gonadotropins (hCG), calcitonin, prostate-specific antigen (PSA).

XXIV. Endocrine function

- a. Hormone actions: Mechanism of action of insulin, glucagon, epinephrine, steroids.
- b. Thyroid function tests.

XXV. Biochemical tests for atherosclerosis and myocardial infarction

- a. Lipid profile, apoprotein, homocysteine and C-reactive protein.
- b. CKMB, troponins.

XXVI. SI units, quality control and standardization

- a. Clinical chemistry: Interpretation and reference values of blood glucose, urea, creatinine, uric acid, cholesterol, calcium, proteins, albumin and A/G ratio.
- b. Instrumentation including autoanalyzer.

XXVII. Biomedical waste management

- a. Types, potential risks and their safe management.

PRACTICALS**To be Done by the Students***Qualitative Analysis*

- a. Reactions of monosaccharides—glucose and fructose.
- b. Reactions of disaccharides—lactose, maltose and sucrose.
- c. Reactions of polysaccharides—starch.
- d. Identification of unknown carbohydrates.
- e. Precipitation and coagulation reactions of protein.
- f. Color reactions of protein—albumin and casein.
- g. Identification of unknown proteins.
- h. Identification of substances of physiological importance.
- i. Normal constituents of urine.
- j. Organic: Urea, uric acid and creatinine.
- k. Inorganic: Ca, P, Cl, SO_4 and NH_3 , specific gravity.
- l. Analysis of abnormal urine.
- m. Spectroscopic examination of hemoglobin derivatives and preparations of hemin crystals.
- n. Spot test for PKU, alkaptonuria and homocystinuria.
- o. Spotters.

Quantitative Estimation

- a. Estimation of blood glucose and interpretation.
- b. Estimation of blood urea and interpretation.
- c. Estimation of serum inorganic phosphorus and interpretation.
- d. Estimation of total serum proteins, serum albumin and A:G ratio.
- e. Estimation of urinary creatinine and interpretation of creatinine clearance.
- f. Interpretation of charts and case reports.

Demonstration Only

- a. Colorimetry.
- b. Paper chromatography.
- c. Paper electrophoresis.
- d. Glucose tolerance tests.
- e. Determination of AST (SGOT) and ALT (SGPT).
- f. Estimation of serum cholesterol (Kit method).
- g. Determination of ascorbic acid.
- h. Principle of flame photometry.
- i. Determination of glucose and proteins in CSF.
- j. Estimation of albumin in urine and tests for Bence Jones proteins in urine.

UNIVERSITY EXAMINATION PATTERN**Eligibility for Writing the University Examination**

The candidate should have at least 35% aggregate in the two of the three internals conducted by the college and should also have minimum 75% attendance in Theory and Practical classes conducted.

Criteria for Passing the University Examination

- The candidate should secure minimum 50% in the university theory examination (University theory + Viva voce) and the university practical examinations separately.
- Candidate should also score 50% in Group A (University theory + Viva voce) and Group B (University Practical + Internal Assessment Theory and Practical)
- Class of passing would be determined from total of Group A + Group B. (Distinction—75% and above; First Class—65%–74.9%; Pass Class—50%–64.9%; Fail—<50%).

Distribution of Marks

	Internal assessment		University examination	
	Maximum marks	Minimum marks to qualify	Maximum marks	Minimum marks to pass
Theory examination	20 marks	7 marks	100 marks	
Viva voce	—	—	20 marks	60 marks
Practical examination	20 marks	7 marks	40 marks	20 marks

Theory Examination

There shall be two papers of 50 marks each in a common question paper carrying 100 marks. The pattern of questions in each paper would be of three types.

1 Long Essay Questions	1 × 10 marks	10 marks
5 Short Essay Questions	5 × 5 marks	25 marks
5 Short Answer Questions	5 × 3 marks	15 marks
Total		50 marks

Distribution of Chapters in Paper I and II for University Examination with Weightage of Marks

Paper I		Paper II	
Topics	Marks	Topics	Marks
Cell structures and functions, subcellular organelles, cell membranes, transport across the membranes	5	Nucleotides and nucleic acid chemistry	5
Chemistry, digestion, absorption and metabolism of carbohydrates	10	Purine and pyrimidine nucleotide metabolism, DNA metabolism, RNA metabolism, protein biosynthesis	10

Contd...

Paper I		Paper II	
Topics	Marks	Topics	Marks
Chemistry, digestion, absorption and metabolism of lipids	10	Vitamins	10
Amino acids and protein chemistry, general reactions of amino acids, digestion and absorption, urea cycle and metabolism of amino acids	10	Minerals	10
Endocrine functions and biochemical tests	5	Molecular genetics, regulation of gene expression, recombinant DNA technology, PCR and gene therapy	5
Detoxification and xenobiotics	5	Electrolyte and water balance, acid-base balance	10
Enzymes	10	Nutrition and energy metabolism	10
Biological oxidation, integration of metabolism, TCA cycle and regulation of metabolism	10	Heme metabolism, normal and abnormal hemoglobin, plasma proteins and immunoglobulins	10
Free radicals and antioxidants	5	Liver function tests	5
Biochemistry of cancer, oncogenes and tumor markers	5	Kidney function tests	5
		Clinical chemistry, quality control, interpretation and reference values and analysis	5

Note:

- Marks allotted to each topic under each paper add up to more than 50 marks and they have been allotted marks only to signify the importance of the chapter.
- Long essays may be asked from topics carrying 10 marks but short essays and short answers can be asked from any of the topic.
- Topics assigned to the different papers are generally evaluated under those sections. However, a strict division of the subject may not be possible and some overlapping of topics is inevitable and students are advised to be prepared to answer overlapping topics.

Practical Examination

Practical examination consists of two exercises of one-hour duration and 20 marks each.

Distribution of Practicals in Session I and II for University Examination with Marks

	Marks
Exercise I	
Quantitative estimation (every candidate shall perform one given procedure)	
a. Principle and procedure for the estimation asked in the question should be written by the candidate in first 5 minutes	5 marks
b. After collecting papers, correct procedure for the estimation is given and practical examination is done. Marks can be awarded for	10 marks
i. Results (values)	
ii. Calculations and reporting	
iii. Interpretation of results and application of estimate	

Discussion of case studies, graphs and charts (5 in number 1 mark each)

Exercise II

- | | |
|--|---------|
| a. Qualitative analysis (every candidate shall perform one given procedure such as identification of carbohydrates, proteins, substance of physiological importance, analysis of normal urine, analysis of abnormal urine) | |
| i. For selection of appropriate reactions | 5 marks |
| ii. For reasoning of analysis and correct reporting | 5 marks |
| iii. For interpretation of results and application of estimation | 5 marks |
| b. Five spotters, biochemical techniques—chromatography, electrophoresis, osazone preparation, biochemical tests and reagents | 5 marks |

Viva Voce

The viva voce examination shall carry 20 marks and all the examiners will conduct the viva examination separately for each candidate.

Question Bank

STNRN VSDN

Section 1: CHEMICAL CONSTITUENT OF LIFE**CHAPTER 1: BIOMOLECULES AND THE CELL****Short Essays**

- | | | |
|---|----|-----------------------|
| 1. Draw a neat diagram of a cell and its organelles. Explain the functions of each. | 10 | D12(RS ₃) |
| 2. Mitochondrial structure and important functions. | 12 | D05 |
| 3. Lysosomes. | 7 | 12 J07 |

Short Answers

- | | | | |
|--|---|----|----------------------------|
| 1. Mitochondria. | 6 | 12 | J12(RS ₃) |
| 2. Endoplasmic reticulum. | 6 | 11 | J10(RS ₂) |
| 3. Give metabolic function of endoplasmic reticulum and mitochondria. | 6 | 13 | J07(RS ₂) |
| 4. Lysosomes (metabolic functions and clinical significance). | 7 | 12 | D10(RS ₂), D16 |
| 5. Name subcellular organelles. Which are metabolic functions of cytosols? | 8 | 13 | J05(RS ₂) |

CHAPTER 2: CARBOHYDRATES**Short Essays**

- | | | | |
|--|----|----|--|
| 1. Function of carbohydrates. | 9 | 88 | D08(RS ₂) |
| 2. Epimerization. | 12 | 90 | J11 |
| 3. Invert sugar. | 19 | 95 | J98 |
| 4. Polysaccharides. | 20 | 96 | J00 |
| 5. Describe the structure and biomedical importance of homopolysaccharides. | 21 | 96 | J02 |
| 6. What are mucopolysaccharides (glycosaminoglycans)? Give their biomedical importance with examples (name the functions and composition of four mucopolysaccharides). | 23 | 98 | D15(RS ₃), J16(RS ₃), J04, J12 |
| 7. Chondroitin sulfate. | 25 | 98 | J99, D04 |

Short Answers

- | | | | |
|--|----|----|----------------------------|
| 1. Benedict's test and its importance. | — | 92 | J12 |
| 2. Compare and contrast starch and glycogen. | — | 96 | D15(RS ₃), J00 |
| 3. Epimerism and anomers. | 12 | 90 | J14(RS ₃) |

Contd...

Contd...

	STNRN	VSDN
4. What are epimers? Give examples (name two epimers of alpha D-glucose).	12	90 D07
5. Mutarotation.	14	90 D06(RS2), J06
6. Detection of reducing sugar in urine.	16	92 J02
7. Glycosidic linkage.	18	95 J09
8. What is the clinical importance of glycosides?	18	93 D06
9. Invert sugar.	19	95 D14, D15
10. Milk sugar.	20	95 D00
11. Mention four homopolysaccharides.	21	96 D09
12. Amylose and amylopectins.	21	96 D00
13. Animal homopolysaccharide.	22	96 J98
14. Glycosaminoglycans.	23	98 J06(RS2), J08, J14
15. Heteropolysaccharides.	23	97 D98, D11
16. Give the composition of hyaluronic acid.	24	98 J13
17. Name mucopolysaccharides. Mention their functions.	25	98 J05(RS2)
18. Write the composition of any two heteropolysaccharides.	25	98 D12

CHAPTER 3: LIPIDS

Long Essay

1. Define lipids. Classify lipids with an example for each. Mention the functions of the lipids. 29 103 D12(RS3)

Short Essays

1. Classify of lipid with examples. What are essential fatty acids? Mention one function of each. 29, 32 103, 242 D11
2. Compound lipids. 29 103 D98
3. What are essential fatty acids? what are the functions of essential fatty acids? 32 242 D16(RS3)
4. Phospholipids—define, classify with examples, significance (functions), composition and functions of any two. 35 108 D09(RS2), D01, D03, J04, J08, D10, J12

Short Answers

1. Unsaturated fatty acid (two examples). 30 104 D05, J09
2. Essential fatty acids and their importance. 32 242 D05(RS2), D15(RS3), J99, J00, D07, D08, D12, J14, J15

Contd...

Contd...

	STNRN	VSDN
3. Triglycerides.	33	106 J98
4. Rancidity.	34	107 J08(RS3), J06
5. Lipid peroxidation—clinical importance.	34	241, 428 D07(RS2)
6. Phospholipids (name any two with their composition and functions).	35	108 D13(RS3), D06, J10, D12
7. Lecithin.	37	109 J99
8. Name the components of sphingomyelin.	37	110 D13
9. What are the components of ceramide? Name a phospholipid which contains ceramide.	37	110 J07
10. Surfactant—composition and function.	38	109 J02, J15
11. Gangliosides.	38	111 J98

CHAPTER 4: PROTEINS AND AMINO ACIDS

Long Essay

1. Classify amino acid based on their structure giving examples. 24 J14(RS3)

Short Essays

1. Essential amino acids. 50 27 D09(RS2)
2. Describe the decarboxylation reactions of amino acids with four examples. Give its significance. 53 29 J11(RS2), J17(RS3)
3. Structural organization of proteins. 55 36 J09, D12
4. Define primary, secondary, tertiary and quaternary structure of protein. What are the noncovalent forces which preserve the secondary structure? 55 36 D11(RS3)
5. Secondary structure of proteins. 59 38 J08(RS2), J07
6. Give the salient features of α -helical structure and quaternary structure of proteins. 59 39 D13
7. Describe the bonds that contribute to (stabilize) protein structure. 61 37 J98, D03
8. Classify proteins based on their function giving an example for each class. 67 43 J13(RS3)
9. Biologically active peptides (biological importance of peptides). 68 45 J08, D16
10. Glutathione. 68 45 D99

Short Answers

1. Name two hydroxy amino acids. 49 24 J07
2. Nutritional classification of amino acids. 50 27 J10(RS2)

Contd...

Contd...

	STNRN	VSDN	
3. Essential amino acids and their importance (functions).	50	27	J11(RS2), D98, J09, J03, J06, D09, D10, D03, J08
4. Mention two/four nonprotein amino acids and their significance.	54	26	J10
5. Peptide bond.	56	31	D13(RS3), D10
6. Secondary structure of proteins.	59	38	D14(RS3)
7. Tertiary and quaternary structure of proteins.	61	39	J05(RS2)
8. Give brief account on quaternary structure of proteins.	61	39	J15(RS3)
9. Bonds stabilizing protein structure.	61	36	J07, D07, J13
10. What is isoelectric pH? What is the application of isoelectric pH? State properties of a protein at its isoelectric pH.	64	28, 43	J07
11. Name two agents used to precipitate proteins.	64	43	J99, D01
12. What is biuret reaction? What is its application?	65	46	J10(RS2), J15(RS3), D16(RS3), J99, J08, J11, D12
13. Denaturation of proteins and factors causing denaturation.	65	44	J03
14. What is heat coagulation test? What is its clinical application?	66	44	D07(RS2)
15. Functional classification of proteins.	67	43	D09(RS2)
16. What is complete protein?	68	45	J06(RS2), D06
17. Biologically active peptides and their functions.	68	45	D12(RS3), D16(RS3), D12
18. Glutathione and its significance (role in erythrocytes).	68	45	

CHAPTER 5: NUCLEIC ACIDS AND NUCLEOTIDES

Long Essay

1. Draw neat diagram of Watson Crick model of DNA, explain its characteristics and the bonds that play a role in the stability of DNA structure.	77	557	J15(RS3)
--	----	-----	----------

Short Essays

1. Structure and function of DNA.	76	557	D01, J08
2. RNA—types, salient features and functions.	81	569	J13(RS3)

Contd...

Contd...

	STNRN	VSDN	
3. Structure and functions of mRNA.	81	570	J11(RS2)
4. Structure and functions of tRNA. Mention the unusual bases present in it.	83	578	D13(RS3), J18(RS3), J01, D06, D12
Short Answers			
1. Distinguish between RNA and DNA.	—	558	D05(RS2), J06, J12
2. Cyclic nucleotides.	—	544	J06(RS2), J11
3. Mention the functions of DNA.	72	558	J02
4. Which are biologically important nucleotides? Mention their functions.	73	—	J05(RS2), D05
5. Name four adenosine derivatives.	75	543	D01
6. Salient features of Chargaff's rule.	77	558	D10, D15
7. Salient features of Watson-Crick model of DNA.	77	557	D11
8. Base pairing rule and Wobble hypothesis.	78	558, 580	J13(RS3)
9. Base pairing rule and its importance.	78	558	D07(RS2), J14
10. Messenger RNA (mRNA)—structure and functions.	81	570	J98, J05, J08
11. Ribosomal RNA.	83	579	J15(RS3)
12. Draw a neat labeled diagram of tRNA.	83	578	D14(RS3)
13. Types of RNA and their function.	84	569	J07(RS2), D00, J09
14. What is the role of tRNA?	84	578	D09

CHAPTER 6: ENZYMES

Long Essays

1. What are enzymes? Classify enzymes with one example each. Explain any four factors that affect enzyme activity. Add a note on enzyme specificity.	87, 90, 98	52, 60, 68	J13(RS3), J14
2. Classify enzymes giving an example with the reaction catalyzed.	88	53	D15(RS3)
3. Explain the influence of various factors on enzyme activity.	90	60	D06(RS2), D16(RS3)
4. Define the enzyme inhibition. Explain the features of competitive and non-competitive inhibition. Mention the therapeutic importance of competitive inhibition.	94	63	D16

Contd...

Contd...	STNRN	VSDN	
5. Define isoenzymes. Mention the principles used for separation of isoenzymes. Write about the clinical importance of isoenzymes.	112	69, 78	D07(RS2)
Short Essays			
1. Define and classify enzymes (IUB classification) with one example for each class indicating the reaction catalyzed.	88	53	J18(RS3), J02, D09, J11, J12
2. Factors affecting enzyme action (reaction).	90	60	D06, D10
3. K_m value (Michaelis-Menten constant) of an enzyme and its significance with a suitable example.	90	61	D10(RS2), J12(RS3), J08
4. Effect of pH and temperature on enzyme catalyzed reaction.	91	62	J10
5. Describe the various type of enzyme inhibition giving suitable examples.	94	63	D18(RS3)
6. Explain competitive and noncompetitive inhibition. Mention significance of competitive inhibition.	94	63	J07(RS2)
7. Competitive inhibition—features, examples, importance in medicine (clinical use).	94	63	D08(RS2), J99, D02, D04, D07, D14
8. Noncompetitive enzyme inhibition.	96	64	J10(RS2)
9. Explain enzyme specificities with examples.	98	68	J12(RS3), J15
10. Coenzyme and their role in metabolism with four examples.	99	54	J07, J09
11. Describe the regulation of enzyme activity.	103	60	J04, J05
12. Allosteric enzymes.	103	66	J14(RS3), D99
13. Explain the mechanism of action of allosteric enzymes? Name the allosteric inhibitor and allosteric activator for phosphofructokinase and acetyl CoA—carboxylase.	103	66	D11(RS3)
14. Proenzymes.	105	63	D98
15. Therapeutic uses of enzymes.	108	84	J05(RS2)
16. Diagnostic importance of enzymes (enzymes in clinical diagnosis)—diagnostic enzymology.	110	78	J11(RS2), J08, D08, D12, D13

Contd...

Contd...	STNRN	VSDN	
17. How does estimation of enzymes in serum help in clinical diagnosis (clinical significance of serum enzyme estimation)? Illustrate with five examples.	110	78	J01
18. Name five enzymes of diagnostic significance. Give the normal serum level and one clinical condition associated with their increase.	110	78	D01
19. Isoenzymes and their clinical importance citing three examples.	112	69	D05(RS2), J16(RS3), J17(RS3), D17(RS3), D16
20. What are isoenzymes? Discuss the isoenzyme forms of LDH.	112	69, 79	D15
21. What are isoenzymes? Name the isoenzymes forms of LDH and CK. What is their clinical significance?	112	69, 79	J03
22. What are isoenzymes? Explain the enzyme profile in myocardial infarction.	112, 115	69, 79	D11
23. Clinical importance of enzymes in assessment of cardiac disease and liver function.	115	79, 81	D13(RS3)
24. Name three enzymes commonly estimated in myocardial infarction. Give its importance and limitations.	115	79	D14(RS3)
25. Diagnostic enzymes used in the assessment of different liver functions.	115	81	D15(RS3)
Short Answers			
1. Classify enzymes with suitable examples.	88	53	J01, D04, J06
2. Lyases.	89	54	J98
3. K_m value of enzymes and its significance.	90	61	D05(RS2), J01, D04, D08, J11, J13
4. Explain the relationship between K_m and affinity.	91	61	D16(RS3)
5. Explain how change in temp alters the enzyme activity.	91	62	J00
6. Explain how change in pH alters the enzyme activity.	92	62	D00
7. Competitive inhibition of enzyme activity (give two examples).	94	63	J16(RS3), D05
8. Methanol poisoning can be alleviated by ethanol, justify.	94	—	J06(RS2)

Contd...

Contd...	STNRN	VSDN	
9. Mention the actions and uses of two competitive enzyme inhibitors.	95	64	J03, D03
10. Define absolute specificity of enzyme. Give two examples.	98	68	D02
11. Coenzymes.	99	54	D13(RS3)
12. What is meant by lock and key mechanism of enzymes?	101	58	D09
13. Define allosteric enzyme with an example and name modulators for the enzyme.	103	66	D06, D12
14. Define zymogens (proenzymes). Give two examples.	105	63	D09(RS2), J00, D02, J03, J04, D08, D10
15. What are ribozymes? Mention one use of ribozymes.	108	573	D09
16. Give three/two examples of enzymes having therapeutic use and indicate their specific applications.	108	84	D12(RS3), D02
17. Enzymes of diagnostic importance.	110	84	J13(RS3), J09, D14
18. Serum amylase and its diagnostic significance.	111	83	J10(RS2), J99
19. Mention the significance of serum amylase and alkaline phosphatase estimation.	111	83, 81	J05
20. Diagnostic significance of serum alkaline phosphatase.	111	81	D15
21. Define isoenzymes. Give one example.	112	69	D05, J06, J08
22. Name the isoenzymes of LDH. Mention their significance.	112	80	D03
23. CPK isoenzymes and its clinical significance.	114	79	J99, J07, J15
24. Explain troponin as a marker for myocardial infarction.	115	79	D05(RS2)
25. Explain enzyme profile in myocardial infarction.	115	79	J07(RS2)

CHAPTER 7: VITAMINS

Long Essays

1. Give an account on chemistry, sources, absorption, daily requirement, biochemical functions, manifestations of deficiency and toxic effects of vitamin A.

Contd...

Contd...	STNRN	VSDN	
2. How provitamin D is converted to its active form? Give an account of chemistry, sources, daily requirement, biochemical functions and deficiency manifestations of vitamin D.	127	458	J03
3. Discuss the chemistry, source, requirement, metabolic functions and deficiency manifestations of vitamin C (ascorbic acid) in the human body.	135	481	D05(RS2), D99
4. What are the sources, functions, deficiency manifestations and daily recommended allowance of thiamine?	138	466	D17(RS3), D09
5. Name the coenzyme forms of vitamin involved in amino acid metabolism. Discuss the biochemical functions and deficiency manifestations of this vitamin.	146	471	J06(RS2)
6. Discuss RDA, Functions and deficiency manifestations of folic acid. How is it interlinked to vitamin B ₁₂ ?	154, 160	474	D16(RS3)
Short Essays			
1. Name a provitamin form of vitamin A. Add a note on sources, functions, daily requirement, causes and features of deficiency of vitamin A.	122	454	J09(RS2), J10(RS2), D11(RS3), J12(RS3), J18(RS3), D02, J05, J09
2. Wald's visual cycle.	124	454	J08
3. Active form of vitamin D and its biochemical role.	127	458	D08
4. Vitamin D metabolism. Add a brief note hepatic osteodystrophy.	127	458	D05
5. Synthesis of calcitriol in the body and its uses.	127	458	J00
6. Biochemical functions and causes and features of deficiency of vitamin D.	128	459	J07(RS2), J11(RS2), J04
7. Vitamin E.	131	460	J99, D04
8. Sources, daily requirements, functions and deficiency manifestation of vitamin C.	135	481	D07(RS2), J08(RS2), D18(RS3), D07, D11
9. Explain the following aspects of thiamine: (a) Coenzyme form, (b) Biochemical function and (c) Deficiency.	138	467	J05(RS2), D01, D14

Contd...

Contd...	STNRN	VSDN
10. Mention the functions of thiamine pyrophosphate (TTP) citing the reactions in which it is involved.	138	467 J14
11. Explain the following aspects of riboflavin: (a) Coenzyme forms, (b) Biochemical functions.	140	467 D02
12. Give the biochemical functions of niacin with examples and manifestation of its deficiency.	143	469 J13(RS3)
13. Name the coenzyme form of vitamin B ₆ (pyridoxine). Describe the biochemical reactions involving it/biochemical functions of pyridoxine (pyridoxal phosphate co-decarboxylase).	146	471 D10(RS2), D98, J02, D14
14. Give the coenzyme role of pantothenic acid and its importance.	152	472 J15(RS3)
15. Chemistry, sources, daily requirement, coenzyme forms and functions of folic acid.	153	474 D06(RS2), J04
16. Hyperhomocysteinemia.	156	476 J07
* Coenzyme form of vitamin B ₁₂ and its biochemical functions.	157	478 D15(RS3)
Short Answers		
1. Hypervitaminosis.	—	457, 460 J09
2. FIGLU excretion test.	—	D08(RS2), J01, D04, D10, J11, D16
3. Provitamins.	—	454 J00
4. Vitamin A—functions (antioxidant role), RDA, deficiency manifestations.	124	454 J14
5. Visual cycle.	124	454 D00
6. Mention causes and clinical features of hypervitaminosis A.	126	457 J06(RS2), J15, D15
7. Vitamin D—biochemical functions, deficiency symptoms.	128	459 J12(RS3), D15(RS3), J02, J05, J10, J14
8. Vitamin E—functions/antioxidant role.	131	461 D10(RS2), J09, J12
9. Vitamin K—biochemical role and requirement.	133	461 J13(RS3)
* Vitamin C—functions (role in iron absorption), deficiency manifestations (scurvy).	136	481 D99, D05, J06, D10, J11

Contd...

Contd...	STNRN	VSDN
11. Thiamine—sources, daily requirements, role, deficiency manifestations.	138	466 J00
* TTP as a coenzyme in two metabolic reaction of the body.	138	467 J12(RS3), J11(RS2), D11
13. Types and causes of beri-beri.	139	467 D06
14. What is the coenzymic form of niacin and give one reaction where it is utilized?	143	469 J00, D14, D15
15. Niacine—coenzymic forms and deficiency manifestations (pellagra).	143	469 J07(RS2)
16. Functions of pyridoxal phosphate.	146	471 J10
17. How is histamine formed? What is the role of histamine?	147	297 D00
18. Biotin.	150	473 J01, D04
19. Name the anti-egg white injury factor, its source and coenzyme function.	150	473 J05, J08
20. Describe two carboxylation reactions.	150	474 J00
21. Functions of folic acid.	154	474 D16
* Explain the role of folic acid in DNA synthesis.	154	475 J14(RS3), D98, D00
23. FIGLU.	155	— J13(RS3), D15
24. Name two folate antagonists and their therapeutic use.	156	476 D02
25. What are the coenzymic forms of cobalamin?	156	478 D11
26. Name the biochemical functions of vitamin B ₁₂ .	157	478 D05
27. What are antivitamins? Give two examples (vitamin antagonists).	162	474, 476 D01
28. Mention the functions of vitamin E and vitamin K.	132, 134	461 J03, D08
29. Cause of scurvy and beri-beri.	137, 139	482, 467 D00
30. Write coenzyme forms of niacin and riboflavin.	143, 140	469, 467 J04
31. Coenzyme form of niacin and folic acid.	143, 154	469, 474 J09(RS2)
32. Coenzymic form of vitamin B ₁₂ and folic acid.	156, 154	478, 474 D00
33. What is the daily requirement of thiamine, niacin and pyridoxine?	138, 144, 149	467, 470, 472 D08

Contd...

Contd...

	STNRN	VSDN
10. Mention the functions of thiamine pyrophosphate (TTP) citing the reactions in which it is involved.	138	467 J14
11. Explain the following aspects of riboflavin: (a) Coenzyme forms, (b) Biochemical functions.	140	467 D02
12. Give the biochemical functions of niacin with examples and manifestation of its deficiency.	143	469 J13(RS3)
13. Name the coenzyme form of vitamin B ₆ (pyridoxine). Describe the biochemical reactions involving it/biochemical functions of pyridoxine (pyridoxal phosphate co-decarboxylase).	146	471 D10(RS2), D98, J02, D14
14. Give the coenzyme role of pantothenic acid and its importance.	152	472 J15(RS3)
15. Chemistry, sources, daily requirement, coenzyme forms and functions of folic acid.	153	474 D06(RS2), J04
16. Hyperhomocysteinemia.	156	476 J07
* Coenzyme form of vitamin B ₁₂ and its biochemical functions.	157	478 D15(RS3)

Short Answers

1. Hypervitaminosis.	—	457, 460 J09
2. FIGLU excretion test.	—	D08(RS2), J01, D04, D10, J11, D16
3. Provitamins.	—	454 J00
4. Vitamin A—functions (antioxidant role), RDA, deficiency manifestations.	124	454 J14
5. Visual cycle.	124	454 D00
6. Mention causes and clinical features of hypervitaminosis A.	126	457 J06(RS2), J15, D15
7. Vitamin D—biochemical functions, deficiency symptoms.	128	459 J12(RS3), D15(RS3), J02, J05, J10, J14
8. Vitamin E—functions/antioxidant role.	131	461 D10(RS2), J09, J12
9. Vitamin K—biochemical role and requirement.	133	461 J13(RS3)
* Vitamin C—functions (role in iron absorption), deficiency manifestations (scurvy).	136	481 D99, D05, J06, D10, J11

Contd...

Contd...

	STNRN	VSDN
11. Thiamine—sources, daily requirements, role, deficiency manifestations.	138	466 J00
* TTP as a coenzyme in two metabolic reaction of the body.	138	467 J12(RS3), J11(RS2), D11
13. Types and causes of beri-beri.	139	467 D06
14. What is the coenzymic form of niacin and give one reaction where it is utilized?	143	469 J00, D14, D15
15. Niacine—coenzymic forms and deficiency manifestations (pellagra).	143	469 J07(RS2)
16. Functions of pyridoxal phosphate.	146	471 J10
17. How is histamine formed? What is the role of histamine?	147	297 D00
18. Biotin.	150	473 J01, D04
19. Name the anti-egg white injury factor, its source and coenzyme function.	150	473 J05, J08
20. Describe two carboxylation reactions.	150	474 J00
21. Functions of folic acid.	154	474 D16
* Explain the role of folic acid in DNA synthesis.	154	475 J14(RS3), D98, D00
23. FIGLU.	155	— J13(RS3), D15
24. Name two folate antagonists and their therapeutic use.	156	476 D02
25. What are the coenzymic forms of cobalamin?	156	478 D11
26. Name the biochemical functions of vitamin B ₁₂ .	157	478 D05
27. What are antivitamins? Give two examples (vitamin antagonists).	162	474, 476 D01
28. Mention the functions of vitamin E and vitamin K.	132, 134	461 J03, D08
29. Cause of scurvy and beri-beri.	137, 139	482, 467 D00
30. Write coenzyme forms of niacin and riboflavin.	143, 140	469, 467 J04
31. Coenzyme form of niacin and folic acid.	143, 154	469, 474 J09(RS2)
32. Coenzymic form of vitamin B ₁₂ and folic acid.	156, 154	478, 474 D00
33. What is the daily requirement of thiamine, niacin and pyridoxine?	138, 144, 149	467, 470, 472 D08

Contd...

Contd...

STNRN VSDN

Section 2: PHYSIOLOGICAL BIOCHEMISTRY

CHAPTER 8: DIGESTION AND ABSORPTION

Long Essay

1. Write in detail about the digestion and absorption of lipids? Write about causes of fatty stools. 174 191 J98

Short Essays

1. Give an account of digestion of carbohydrates from GIT. 168 126 D13
2. Explain the mechanism involved in the absorption of glucose. Describe the causes and features of lactose intolerance. 170 127 J99, J02, D04
3. Lactose intolerance. 171 127 D05
4. Write in brief about the digestion and absorption of proteins. 171 252 D14(RS3), J06, J13
5. Digestion and absorption of lipids. 174 191 D15(RS3), J12
6. Enzymes involved in the digestion of lipids (lipases). 174 191 D05
7. Name the different types of lipases involved in lipid metabolism. Mention their sites of action, function and activation. 174 192 J03

Short Answers

1. Name the enzymes involved in carbohydrate digestion. 168 126 D09
2. Digestion and absorption of disaccharides. 168 126 D12(RS3)
3. Describe the absorption of glucose. 169 127 J04
4. Lactose intolerance—causes and features. 171 127 D98, D99, J04, D08, J12
5. Give an example of proteolytic enzyme and its specificity. 171 253 D06, D14
6. Name the two endopeptidases with their specifications. 171 252 J09(RS2)
7. Role of hydrochloric acid in protein digestion. 172 253 J01, D04
8. How is pepsinogen activated? What is the function of pepsin? 172 253 J10
9. Pepsinogen activation and action of trypsin. 172 253 D11
10. Describe the role of bile salts in lipid metabolism. 174 191 J13

Contd...

Contd...

STNRN VSDN

11. What is steatorrhea? Mention the causes. 177 194 J12(RS3), J02, J03, D16

CHAPTER 9: PLASMA PROTEINS

Long Essay

1. What are plasma proteins? Write a note on their separation and functions. 182 384 D08

Short Essays

1. How plasma proteins are separated? Explain the significance of M band. What is A/G ratio? What is its clinical significance? 182 384 J04
2. What is electrophoresis? Name five plasma proteins and their functions. 182 384 D11
3. Name and explain the functions of plasma proteins with clinical significance. 183 385 D14(RS3)
4. What is normal serum protein level? Mention three important functions of albumin. 183 384 D12(RS3)
5. Enumerate the functions of albumin. Mention the causes of hypoalbuminemia and consequences of hypoalbuminemia. 183 385, 387 J11(RS2), J03
6. List conditions when albumin/globulin (A/G) ratio is altered. 183 387 D12(RS3)
7. Transport proteins of blood. 184 387 J09(RS2)
8. Acute phase proteins. 186 388 J10(RS2)
9. Immunoglobulins—enumerate, structure and functions. 187 649 J03, D12, D16

Short Answers

1. What is the normal level of plasma proteins? Name a disease which features hypoalbuminemia. — 384, 387 D05
2. Negative acute phase reactants. — 389 D15
3. Describe how plasma protein are separated in the clinical laboratory. 182 384 D17(RS3)
4. What is electrophoresis? Enumerate major classes of proteins separated on electrophoresis. 182 384 J01, D04
5. Serum albumin—functions. 183 385 D06(RS2), J10
6. Normal values of serum proteins and its fractions. 184 384 J99

Contd...

Contd...

	STNRN	VSDN	
7. Plasma proteins—enumerate and functions of plasma proteins.	184	384	J16(RS3), J06, D10, D12
8. Hypoalbuminemia.	185	387	D17(RS3)
9. Ceruloplasmin.	186	388	J99, D00, J09, J15
10. Acute phase proteins.	186	388	D18(RS3)
11. Immunoglobulins—enumerate, structure and functions. Outline the structure of immunoglobulins.	187	649	D10(RS2), D12(RS3), J18(RS3), D07, J08, D10
12. Immunoglobulin G (IgG).	188	649	J98
13. Immunoglobulin A (IgA) and immunoglobulin M (IgM).	188	649	J11(RS2)
14. Structure of immunoglobulin M.	189	649	J14
15. Bence-Jones proteins—significance and detection.	190	378, 651	D05(RS2), J06(RS2), D11(RS3), D01, D08
16. Anticoagulants.	192	—	J08(RS2)

CHAPTER 10: HEMOGLOBIN AND PORPHYRIA

Long Essays

1. Outline heme synthesis. Write a note on its function and abnormal hemoglobin.	208	325, 344	J09
2. Describe the synthesis and breakdown of hemoglobin. Write a note on hemoglobinopathies.	208, 201, 213	325, 344	D13(RS3)

Short Essays

1. Name five heme proteins and their functions.	—	325	D08(RS2)
2. What is methemoglobin? How it is formed? Mention the causes for methemoglobinemia. How it is detected?	201	344	J16(RS3), D99
3. Hemoglobinopathies (abnormal hemoglobins).	201	344	D05(RS2)
4. Sickle cell hemoglobin.	201	345	J98
5. Discuss the manifestations, molecular basis and laboratory diagnosis of sickle cell disease. What is the biological advantage of sickle cell trait?	202	345	J01
6. Heme synthesis (regulation).	208	327	J17(RS3), J18(RS3), D00, D11

Contd...

Contd...

	STNRN	VSDN	
7. Porphyrins—causes and general features.	210	328	D16(RS3), J18(RS3), J13, J15(RS3), J00, J03
8. What are porphyrias? How are they classified? Name the enzymatic defect and biochemical findings in any one/four of the porphyrias.	210	328	
9. What is porphyria? Mention the defect, signs and symptoms of acute intermittent porphyria.	210	328	D09(RS2), D11(RS3)
10. Congenital erythropoietic porphyria.	212	329	J99, D04
11. Catabolism (degradation) of heme (hemoglobin) in the body adding a note on clinical significance.	213	330	D07(RS2), D14(RS3), D98, J00, D01, D08
12. Bile pigments (bilirubin)—describe the metabolism (formation, transport and detoxification). Write the normal values of serum bilirubin. Name the abnormalities associated with bilirubin metabolism.	213	330	J07(RS2), J09(RS2), J14(RS3), J16(RS3), J99, D04, J14, D14
13. Jaundice.	215	333	D12
14. Hemolytic jaundice.	215	333	D99
15. Unconjugated hyperbilirubinemia.	215	332	D08(RS2)
16. Hepatocellular jaundice.	215	333	D09

Short Answers

1. What is Dubin-Johnson disease?	—	333	J01, D04
2. What is the effect of pH and pCO ₂ on the oxygen dissociation curve?	198	341	D09
3. Hemoglobin as buffering agent.	198	341	D15(RS3)
4. 2,3-bisphosphoglycerate.	199	342	J06(RS2)
5. Carboxy hemoglobin.	201	344	J08(RS2), J99
6. Methemoglobin.	201	344	J10(RS2)
7. Name the hemoglobinopathies (abnormal hemoglobins).	201	344	D07, D09
8. Sickle cell hemoglobin—biochemical defects, alteration in function.	201	345	J06, J07, D13
9. Sickle cell anemia—causes, molecular defect and consequences.	202	345	D07(RS2), J11(RS2), D08, D12
10. Biochemical defect in thalassemia.	205	348	J13(RS3)

Contd...

Contd...

STNRN VSDN

11. Name the levels at which heme synthesis is regulated.	210	327	D02, D07
12. What porphyrias? Name one disorder indicating the underlying cause.	210	328	J04
13. Explain any two types of porphyrias.	210	328	D10
14. Acute intermittent porphyria.	210	328	J14(RS3), J18(RS3), D99, D13
15. Name two porphyrias and the enzyme defect in them.	211	328	J08
16. Degradation of heme.	213	330	J05(RS2), D06(RS2), J04
17. How is bilirubin conjugated (made water soluble).	214	331	J06(RS2)
18. Fate of bilirubin.	215	331	D15
19. Name two causes of unconjugated hyperbilirubinemia.	215	333	J07
20. Normal level of total bilirubin in serum. What is conjugated bilirubin?	215	331	D99, D06
21. Define jaundice. Mention one cause for different types of jaundice.	215	333	D03
22. Obstructive jaundice and its diagnosis (biochemical findings).	215	333	D13(RS3), J02, D08
23. Physiological jaundice.	216	333	J11
24. Name two congenital hyperbilirubinemias and defect in each of them.	216	332	D01
25. What is Crigler-Najjar syndrome? Name the enzymatic defect.	216	332	D02, D05
26. Give enzyme defect in the following conditions.			
a. Drug-induced hemolytic anemia.	a. —	a. —	J09(RS2)
b. Crigler-Najjar syndrome.	b. 216	b. 332	J14(RS3)
27. Gilberts syndrome.	216	333	J14(RS3)

CHAPTER 11: BIOLOGICAL OXIDATION

Long Essays

- Describe the components of electron transport chain. Write a note on uncouplers and inhibitors. 223, 230 316, 319 D08
- Discuss in detail oxidative phosphorylation and enumerate its inhibitors. 226 318, 319 J10(RS2)

Contd...

Contd...

STNRN VSDN

Short Essays

- Write the different components of electron transport chain. Mention four inhibitors of ETC. 224 316 J14(RS3), D16
- Describe the single electron carrier components of respiratory chain. Indicate the sites of ATP formation during electron transport. Name two inhibitors of electron transport. 224 316 J07(RS2), D07(RS2), D02, J03, D03, J08, J10, J13
- What are cytochromes? Indicate their location and functions. 226 317 D99
- What is oxidative phosphorylation? Explain its mechanism (chemiosmotic theory). Mention inhibitors and uncouplers of oxidative phosphorylation. 226 318 J05(RS2), J06(RS2), D98, J01, J04, J06, D06, J14, D14, D15
- What is P:O ratio? Which are inhibitors of electron transport chain? 227 319 D05(RS2)
- What are uncouplers? Mention the uncouplers of oxidative phosphorylation. 231 320 J16(RS3), J15
- Shuttle systems to transport extra-mitochondrial reducing equivalents. 232 316 D05
- Classify the enzymes of biological oxidation. Give one example for each. 234 314 D01

Short Answers

- Differentiate between uncoupler and inhibitors. — — D16
- Expand ATP. What is its free energy of hydrolysis? 219 314 D11
- High energy (phosphate) compounds. 220 314 J13(RS3), J02, D16
- Components of electron transport chain. 224 316 J17(RS3), D11
- Diagrammatic representation of mitochondrial electron transport chain and location of ATP formation sites. 225 318 D09(RS2)
- Cytochromes. 226 317 D11(RS3)

Contd...

Contd...

	STNRN	VSDN	
7. <u>Oxidative phosphorylation—mechanism</u> (chemiosmotic theory), inhibitors, uncouplers (with two examples).	226	318	D06(RS2), J08(RS2), J11(RS2), J15(RS3), D17(RS3), D18(RS3), J98, J03, J05, D12, D13, D16
8. P:O ratio.	227	—	J09, D09, J11
9. Name the inhibitors of cytochrome oxidase.	230	320	D06
10. List the site inhibitors of electron transport chain.	230	319	D16(RS3)
11. Ionophores.	231	17	D12(RS3)
12. Mitochondrial shuttle systems.	232	316	J13(RS3)
13. Describe malate—aspertate shuttle. What is its significance?	233	316	J01, D04

Section 3: METABOLISM

■ CHAPTER 12: INTRODUCTION TO METABOLISM

None

■ CHAPTER 13: METABOLISM OF CARBOHYDRATES

Long Essays

- Describe the reactions of glycolysis indicating the enzymes. Add a note on net yield of ATP under aerobic and anaerobic conditions. 244 128 D17(RS3)★
- Give a detailed account on glycolysis. Explain the energetics and regulation of this pathway. What is the significance of Rapoport-Luebering cycle? 244, 251 128, 134 J98, J08, D12
- Describe the process of aerobic glycolysis. What is substrate level phosphorylation? What is the effect of insulin and cortisol on blood glucose level? 244, 648 128, 313, 167 D11
- Why TCA cycle is called as common metabolic pathway? Describe in detail the tricarboxylic acid cycle (Kreb's citric acid cycle), energy production and its significance. How is it regulated? What is its amphibolic role? Explain how carbohydrates, lipids and amino acids enter this cycle. 253 303 J08(RS2)★, D13(RS2), J04, J10, D14

Contd...

Contd...

	STNRN	VSDN	
5. Describe in detail the major catabolic pathway for acetyl CoA in aerobic organisms. How does it play a pivotal role in metabolism?	253	303	D05
6. What is gluconeogenesis? Write in detail about gluconeogenesis in humans from its predominant precursor (conversion of lactate to glucose) and mention its significance. Write about glucose alanine cycle.	258	135, 138	D11(RS3), D08, D00, J03
7. Discuss the formation of glucose from noncarbohydrate substances.	258	135	J15
8. Trace the pathway of gluconeogenesis starting from alanine. Mention the key enzymes and how they are regulated.	261	135	J09(RS2)★
9. Discuss about the metabolism of glycogen.	263	140	J99
10. What is the biomedical importance of muscle and liver glycogen? Describe the process of glycogen synthesis with its regulation. Name two glycogen storage diseases.	263	140, 141	D06, J11
11. Define glycogenesis and glycogenolysis. Write the reactions of glycogenesis and glycogenolysis in liver. How are these two pathways reciprocally regulated?	263	140, 143	J07(RS2)★
12. Describe the reactions of pentose phosphate pathway (hexose monophosphate shunt). Why is it called multifunctional? Mention the significance of this pathway.	269	144	J02, J09, D10, D15
Short Essays			
1. What is the difference between oxidative and substrate level phosphorylation? Give two examples of substrate level phosphorylation with complete reaction.	313	D10(RS2), J13(RS3), D14(RS3), J99, D04	
2. How is glycogen digested and absorbed? Describe glycogenolysis in the liver.	168, 265 126, 140	J15(RS3)★	
3. Glucose transporters.	243	127	D06
4. Regulation of glycolysis.	249	133	J07
5. Discuss the Embden-Meyerhof pathway that occurs in RBC. Add a note on its energetics.	251	134	J14(RS3)★
6. 2,3-biphosphoglycerate pathway in erythrocytes (Rapoport-Luebering cycle).	251	134	J10(RS2)★, D10(RS2), D06

Contd...

Contd...	STNRN	VSDN	
7. Fate of pyruvate.	251	135	D06
8. Pyruvate oxidation.	251	135	J99, D04
9. Pyruvate dehydrogenase complex—enzymes and co-enzymes components, mechanism of action and biomedical importance.	252	135	D07(RS2), J12
10. Citric acid (TCA) cycle—reactions, energy releasing steps, amphibolic role.	253	303	J09(RS2), D11(RS3), J12(RS3), J18(RS3), J06, J13
11. Gluconeogenesis—(key) reactions (from lactate/alanine), key enzymes, significance.	258	135	D05(RS2), J06(RS2), J13(RS3), D16(RS3), D02, D05, D08, D09, D16
12. What is fate of lactate produced in the muscle? Explain the reactions.	261	138	J01
13. Cori's cycle.	261	134	J12(RS3), J14
14. Glucose alanine cycle.	261	138	J08
15. Synthesis of glycogen (glycogenesis)—reactions and its significance.	263	141	J08(RS2), D07, J12, D13
16. Glycogenolysis—reactions, regulation.	265	140	J10(RS2), J11(RS2), J16(RS3), D18(RS3), J02, D02, J05
17. Glycogen storage disease.	269	144	D06(RS2), J17(RS3), J00, J03, J06, J14
18. Hexose monophosphate shunt—reactions (oxidative phase), significance.	269	144	D13(RS3), J17(RS3), D18(RS3), D06
19. Uronic acid pathway.	275	149	J13
20. Metabolism of galactose.	277	182	D00, D07
21. Metabolism of fructose.	278	181	J00
22. Fructose intolerance.	280	182	D98
Short Answers			
1. Explain substrate level phosphorylation with two examples.	—	313	D01, D02, D07, J11, J12
2. Give the significance of uronic acid pathway.	—	149	J09(RS2)

Contd...

Contd...

Contd...	STNRN	VSDN	
3. Aldolase B.	—	182	D00
4. What are the major differences between hexokinase and glucokinase?	245	129	J05
5. Glucokinase.	245	129	D99
6. Energetics in aerobic and anaerobic pathway of EM pathway (glucose oxidation).	248	132	D99, J09
7. Regulation of glycolysis at the phospho-fructokinase step.	249	133	J18(RS3)
8. Write short note on Rapoport-Luebering cycle.	251	134	J16(RS3), D17(RS3), D12
9. Conversion of pyruvate to acetyl CoA.	251	135	J06
10. Pyruvate dehydrogenase complex.	252	135	J14(RS3), D18(RS3)
11. Amphibolic role of citric acid cycle.	257	308	D10
12. Anaplerosis and its significance.	257	308	J00, D00, J03
13. Any three enzymes unique (key) to gluconeogenesis.	259	136	J11(RS2), J13
14. Cori's cycle.	261	134	J11
15. Describe glucose alanine cycle. Mention its significance.	261	138	J01, D01, D04
16. Glycogen storage disorders.	269	144	J13(RS3)
17. Von Gierke's disease.	269	144	D17(RS3), D99
18. Muscle phosphorylase deficiency.	271	144	D98
19. Mention significance of HMP shunt pathway.	272	147	D05(RS2), J08(RS2), J08, J12
20. Glucose-6-phosphate dehydrogenase deficiency.	275	144	D07(RS2)
21. Uridine diphosphate glucose—glucuronic acid.	276	149	J15(RS3)
22. Galactosemia—enzyme defect, clinical features and biochemical findings.	278	183	D16(RS3), J18(RS3), D99, D02, J05, D12, D16
23. Aldolase B deficiency.	280	182	J98
24. Name the enzyme defective in galactosemia and hereditary fructose intolerance.	278, 280	183, 182	J02, D06

Contd...

Contd...

STNRN VSDN

CHAPTER 14: METABOLISM OF LIPIDS

Long Essays

1. What is carotene and its role in oxidation of fatty acids? Enumerate the steps of beta oxidation of saturated fatty acids (palmitic acid). Write a note on energetic of palmitic acid. Explain the regulation of acetyl CoA in our body. 288 194 D08(RS2), J15(RS3), J01, D02, D04, J05, J06, D07, D10, D13, J15
2. Describe the formation (ketogenesis), utilization (ketolysis) and clinical significance of ketone bodies (ketosis). 295 205 J11(RS2), J18(RS3), J11
3. What is ketosis? What are the causes? What are ketone bodies? Enumerate the steps of formation and utilization of ketone bodies? 295 206, 205 J00
4. Name the ketone bodies. Give two conditions characterized by excessive production of ketone bodies. Explain the metabolic derangements and consequences of ketosis. 295 205, 206 J05(RS2)
5. Describe in detail the de novo synthesis of fatty acids. Add a note on short- and long-term mechanisms that regulate lipogenesis. 298 198 J07
6. Give an account of cholesterol biosynthesis with its regulation. Add a note on atherosclerosis. 311 215, 228 J16(RS3)
7. What are lipoproteins? How are they classified? How are chylomicrons metabolized? 319 217 D09
8. Classify plasma lipoproteins, explain their composition, transport and functions. 319 218 J13(RS3)

Short Essays

1. List various types of fatty acid oxidation. Write about activation of fatty acids for oxidation. 288 194 D07(RS2), J07
2. Describe the beta oxidation of fatty acids. Add a note on energetics of palmitic acid oxidation. 288 194 D05(RS2), D14(RS3), D16(RS3), D05, J09

Contd...

Contd...

STNRN VSDN

3. Explain how odd chain fatty acids are oxidized. 293 197 J14
4. Metabolic activity and abnormality in peroxisomes. 293 J14
5. Ketone bodies—enumerate, formation (ketogenesis), utilization (ketolysis), clinical significance (ketosis). 295 205 J06(RS2), D09(RS2), D00, D06, J09, D12, D14
6. Ketosis. 296 206 J08
7. Outline the de novo synthesis of fatty acid. What are the advantages of having a multifunctional enzyme complex? 298 198 D13(RS3)
8. Fatty acid synthase complex. 299 199 J11(RS2), D06, J09
9. Mention the defect and clinical features of four lipid storage disorder. 310 247 D16
10. Name the ring structure present in cholesterol. Write the key regulatory step in the synthesis of cholesterol. Name four compounds derived from cholesterol. 39, 313, 214 315 D17(RS3)
11. Outline the steps for synthesis of cholesterol. Discuss the rate limiting step and regulation of synthesis of cholesterol. 311 215 D11(RS3), J18 (RS3)
12. How is HMG CoA formed? What is its importance? 311 215 D13
13. Catabolic products of cholesterol. Describe the biomedical importance of three derivatives of cholesterol. 315 217 J09(RS2), D10(RS2), J98, J03
14. How are bile acid synthesized? Mention two functions of bile acids. 315 223 J15(RS3), D10
15. Lipoproteins—enumerate, composition and functions. 319 217 J05(RS2), J14(RS3), J02, D02, D03, J06, J10
16. Chylomicrons (metabolism). 319 219 J10(RS2)
17. Give an account of metabolism of LDL. 321 220 D13
18. Fatty liver (causes) and lipotropic factors. 324 204 D06(RS2), J07(RS2), D08(RS2), D14(RS3), D07, D08, J13, D15

Short Answers

1. Enumerate the consequences of obesity. — 518 J11

Contd...

Contd...	STNRN	VSDN
2. What is the significance of brown adipose tissue?	—	203 J04
3. What is carnitine? Mention its biochemical role of carnitine in β -oxidation (carnitine cycle).	289	194 J06(RS2), J02, J12, J13; D13, D14
4. Energetics in the oxidation of one molecule of palmitic acid to carbon dioxide and water.	291	196 J18(RS3)
5. Methyl malonyl aciduria.	293	198 D98
6. Give enzyme defect in the methyl malonyl aciduria and homocystinuria.	293, 364	198, 276 D16
7. Mention how propionyl CoA is formed during fatty acid oxidation.	293	197 J00
8. Refsum's disease.	294	198 J08(RS2)
9. Ketone bodies.	295	205 D08
10. Name the ketone bodies. Mention two causes of ketosis.	295	205 D02, J03, J04
11. Ketosis.	296	206 J17(RS3)
12. Niemann-Pick disease.	309	246 J10(RS2)
13. Name two lipid storage disorders and indicate the corresponding enzyme defect.	310	247 D07
14. Name four substances synthesized from cholesterol.	315	217 D06
15. Name bile acids. How are they formed?	315	223 J10
16. Bile salts—enumerate, functions (role in digestion).	315	224 J99, J05, D08, D09, D11, J12
17. Reverse cholesterol transport.	316	222 J15(RS3), D05
18. What is normal serum level of cholesterol? Name its four biological functions.	316	223 J07(RS2)
19. What is the normal level of serum cholesterol? Name one bile acid formed from cholesterol.	316	223 J07
20. Plasma lipoproteins—enumerate, functions.	319	218 J17(RS3), D98, J08, D12
21. HDL cholesterol.	319	222 D99, J12
22. What are functions of apolipoproteins?	319	218 J09(RS2)
23. Name the cholesterol rich lipoproteins.	320	219 D06
24. Justify the role of HDL as scavenger of cholesterol.	322	222 D00

Contd...

Contd...

Contd...	STNRN	VSDN
25. Fatty liver—causes.	324	204 J00, D03, J06, J12, J14
26. Lipotropic factors.	326	205 J98, J13, D14
27. Mention two inborn errors of lipid metabolism and indicate the enzyme defect.	306, 309	246 D03
28. Name the biochemical defect in: a. Niemann-Pick disease. b. Gauchers's disease.	306, 309	246 J03

CHAPTER 15: METABOLISM OF AMINO ACIDS

Long Essays

1. Describe how ammonia is formed (sources of ammonia) in the body? Add a note on its transportation. Describe how ammonia is detoxified in the body and name two inborn errors associated with this process..	336	256, 257, 260	D18(RS3), D01, J05, D06, J12, D16
2. Describe in detail the steps of urea cycle. How is it linked to TCA cycle? What is the reference range for serum urea? Write the causes of uremia.	338	258, 261	D11(RS3)
3. Describe the urea cycle. What is the normal blood urea level? Name two conditions in which blood urea level increases.	338	258, 261	D02
4. Describe the metabolism, metabolic defects and special products formed from glycine giving their biomedical importance. Why is glycine nutritionally nonessential?	343	267	D05(RS2), J02, J04, D07
5. How is creatinine synthesized? Discuss about creatinine clearance and its clinical significance.	345	268	J99
6. What are biologically important compounds derived from tyrosine? Describe the metabolism of phenylalanine and tyrosine. Outline the synthesis of different products obtained from phenylalanine. Discuss the inborn errors associated with metabolism (tyrosinemia).	347	289	D10(RS2), J12(RS3), J17(RS3), D99, J01, D04, J07, J08, J10

Contd...

Contd...

STNRN VSDN

7. Name the sulfur-containing amino acids. Describe in detail the metabolism of essential sulfur-containing amino acid and add a note on the special products synthesized from it. Add a note on inborn errors associated with its pathway.	360	272	D05, D12
8. What is the active form of methionine? How it is formed? What are its function? Enumerate the steps of methionine metabolism. Write the disorders associated with its metabolism.	361	272	J00
Short Essays			
1. What are nitrogen producing substances in the body? Explain how they are excreted from the body.	—	—	D17(RS3)
2. What are transamination reactions? Giving two examples discuss the importance of these reactions.	333	256	J13(RS3), D16(RS3), J06, J11, D15
3. Describe transamination. Mention the clinical significance of serum transaminases.	333	256	J05
4. Name the coenzyme forms of vitamin B ₆ . Write the mechanism of transamination.	333	256	J01
5. How ammonia is detoxified in the body?	337	258	J06(RS2), J09
6. Urea cycle (urea formation in liver)—steps, regulations, disorders.	338	258	D06(RS2), J07(RS2), D00, D03, D10, D12, D14
7. How is urea synthesized in the body? Give the reactions. What is the significance of urea cycle?	338	258	D13(RS3)
8. Disorders associated with urea cycle	341	260	D15
9. How is glycine synthesized in the body? Name the products synthesized from glycine (biomedical importance/metabolic role/fate of glycine).	343	267	D06(RS2), D17(RS3), J98, D09, D15
10. Compounds synthesized from glycine and enumerate the steps of synthesis of creatine.	344	268	J12
11. Pathway for synthesis of creatine, phosphocreatine and creatinine. Clinical significance of creatinine kinase.	345	268	J18(RS3)

Contd...

Contd...

STNRN VSDN

12. How creatine phosphate is synthesized? Mention the significance of estimation of urinary creatinine.	345	268	D01
13. How is creatine synthesized? Add a note on creatinine clearance test with respect to its reference range and significance.	345	268	D11
14. Biochemical importance of phenylalanine.	346	289	J15
15. Is tyrosine an essential amino acid? Justify. Write the reactions of three important biological products formed from tyrosine.	346	288	D12(RS3)
16. List the important products formed from tyrosine and write the metabolic pathways leading to the formation of any two of them.	349	289	D07(RS2)
17. Name and explain the steps of formation of three important compounds formed from tyrosine.	349	289	J14
18. Mention the catecholamines. How are they formed?	349	290	D16(RS3), D03
19. Outline the synthesis of epinephrine and give its functions.	349	290	J15(RS3)
20. What is phenylketonuria (PKU)? What are the alternate metabolic pathways for the accumulated phenylalanine? How is it diagnosed biochemically?	352	292	D09(RS2), D10
21. Discuss phenylketonuria under (i) enzyme defect, (ii) Manifestation, (iii) Diagnostic test.	352	292	D15(RS3)
22. Describe tryptophan metabolism.	355	294	J16(RS3)
23. Serotonin	357	295	J08(RS2), D98, D99
24. Describe the fate and functions of methionine.	361	272	D13(RS3)
25. Explain how S-adenosyl methionine is formed. Give examples of five transmethylation reactions.	361	272	J15
26. S-adenosyl methionine—formation, functions.	361	272	D00, D09
27. Metabolic functions of methionine.	361	272	D05, D13
28. Transmethylation reactions with examples.	362	273	J09(RS2), J10(RS2), J12(RS3), J12

Contd...

Contd...

	STNRN	VSDN	
29. Describe the conversion of methionine to cysteine. Add a note on homocystinuria.	362	272	J15(RS3)
30. Metabolic functions of <u>cysteine</u> .	363	273	J05(RS2)
31. Disorders of <u>sulfur-containing</u> amino acids.	363	275	D08(RS2)
32. Cystinuria and homocystinurias.	363	275	J11
33. Describe one carbon metabolism. What is its significance?	365	262	D15(RS3), D07
✓ 34. <u>Maple syrup</u> urine disease.	367	282	J09(RS2)
35. Write about aminoaciduria.	376	298	J07
36. Name the biochemical defect in the following disorders of amino acid metabolism.	377	292	D01
a. Phenylketonuria.	353	293	
b. Alkaptonuria.	306	282	
c. Maple syrup urine disease.	354	293	
d. Albinism.	309	276	
e. Homocystinuria.	336	293	
37. Name the enzyme defective in:	340	246	D05
a. Alkaptonuria.	341		
b. Niemann-Pick disease.	341		
c. Albinism.	342		
d. Gaucher's disease.	342		
Short Answers			
1. Significance of non-protein nitrogenous substances.	—	373	J07(RS2)
2. <u>Transamination reaction</u> and clinical importance.	333	256	J09(RS2), D13(RS3)
3. Formation of ammonia and its toxicity in brain.	336	255	D09(RS2)
4. Formation of glutamine and its importance.	337	278	D12
5. Carbamoyl phosphate synthetase deficiency.	342	260	J98
6. What is the normal level of non-protein nitrogen (NPN) substances in the blood?	342	373	J08
✓ 7. <u>Biologically important</u> compounds formed from <u>glycine</u> .	344	268	D18(RS3), D03, J13, D14
8. How is creatinine synthesized?	345	268	J15, D16

Contd...

Contd...

	STNRN	VSDN	
9. Name the amino acid used for the synthesis of creatinine.	345	268	J07
10. Biologically important compounds derived from tyrosine.	349	289	D08(RS2), J11, D11
11. Melanin synthesis.	349	289	D15
12. Phenylketonuria.	352	292	D00
13. Indicate the biochemical defect in phenylketonuria.	352	292	J14
14. Alkaptonuria.	353	293	D14(RS3), J12, D15
15. Albinism.	354	293	J13
16. Derivatives of tryptophan.	355	294	J12(RS3), D05, D16
17. Serotonin—formation, functions of serotonin.	357	295	D12(RS3), J00, D00
18. Melatonin.	359	296	D15(RS3)
✓ 19. <u>Hartnup's</u> disease.	360	296	J12(RS3), J17(RS3), D14
20. Name the sulfur-containing amino acids. List two disorders of their metabolism.	360	275	D02
21. S-adenosyl methionine (active methionine)—formation..	361	272	D98, D11
22. Three transmethylation reactions of S-adenosyl methionine	362	273	J18(RS3)
23. Homocysteine.	363	276	J09
24. Functions of cysteine.	363	273	D15
25. Enumerate the metabolic disorders associated with cysteine metabolism indicating the defect.	363	275	J02
26. Write the composition of:			
a. 3-phosphoadenosine-5-phospho-	a) 363	—	D13
sulfate (PAPS)	b) 361	272	
b. S-adenosyl methionine (SAM).			
27. What is meant by inborn error of metabolism? What is homocystinuria?	364	276	D11
28. Maple syrup urine disease.	367	282	J00
29. Name the deficient enzyme in:	368	260	J13
a. Hyperargininemia	352	292	
b. Phenyl ketonuria.			
30. How GABA is formed? What is its function?	371	277	J03

Contd...

Contd...

	STNRN	VSDN
31. Name the amino acids which form succinyl CoA.	375	298 D06
32. Name two metabolic disorders of amino acids metabolism and indicate the enzyme defect.	377	292 D07 293 282 293 276
33. Mention the enzyme defects in phenylketonuria and homocystinuria.	377	292 J05 276
34. Name the enzyme defect in: a. Phenylketonuria b. Alkaptonuria.	377	292 D14 293
35. Name the biochemical defect in: a. Phenylketonuria b. Maple syrup urine disease.	377	J03 292 282
36. Polyamines.	378	281 D15(RS3)

CHAPTER 16: INTEGRATION OF METABOLISM

Short Essay

1. Discuss the biochemical/metabolic changes during starvation. 385 122 J14(RS3), J03, J13, D14

Short Answers

1. Sources and fate of acetyl CoA. — 303 D01, J12
2. Biochemical changes in starvation. 385 122 J16(RS3)

CHAPTER 17: METABOLISM OF NUCLEOTIDES

Long Essays

1. What are nucleotides? Explain the catabolism of purine nucleotides. Write briefly on the metabolic disorders associated with purine metabolism. 72, 395 542, 547, 548 J07(RS2)
2. What are sources of C and N atoms of purine? Describe the biosynthesis of purine and add a note on its regulation. 389 544 J13(RS3)
3. Enumerate the reactions of purine degradation and add a note on gout. 395 547, 548 J13
4. How is uric acid formed from purine and add a note on hyperuricemia. 395 547, 548 J18(RS3)
5. Describe the synthesis of pyrimidine and its regulation. 399 549 D12(RS3)

Contd...

Contd...

STNRN VSDN

Short Essays

1. What are nucleotides? What are the sources of C and N atoms of purine nucleotide? Mention the metabolic disorders associated with purine metabolism. 72, 389, 542, 399 544, 548 J14(RS3)
2. Briefly outline the steps of de novo synthesis of purine. 391 544 D11(RS3), J12(RS3)
3. Purine salvage pathways. 393 546 D06(RS2), J15(RS3), D08, J11, D13, D14
4. Salvage pathway. 393, 402 546 J12(RS3), D05(RS2)
5. Catabolism (degradation) of purines and related disorders. 395 547 D06(RS2), D09(RS2), D10(RS2), D13(RS3), D09, J11
6. Synthesis of uric acid. 395 547 J98
7. How is uric acid formed in the body? What is gout? What is the treatment? Explain the basis for the treatment. 395 547 D15(RS3)
8. Hyperuricemia—causes, features and drugs to lower plasma uric acid levels 395 548 J04, J10
9. What is gout? Give its biochemical basis, clinical manifestations and line of treatment. 395 548 D12(RS3), D16(RS3), D99, D00, D07, D11
10. Lesch-Nyhan syndrome and orotic aciduria. 397, 402 549, 551 J05(RS2), D08(RS2)
11. Degradation of pyrimidines. 402 551 J08(RS2)

Short Answers

1. Indicate sources of various (carbon and nitrogen) atoms of purine ring by a diagrammatic representation. 389 544 D09(RS2), D03, D07
2. Describe two reactions of salvage pathway of purine nucleotide synthesis. 393 546 J05
3. What is the function of thioredoxin? 394 551 D09
4. Hypoxanthine. 395 546 D98
5. Mention any two causes of hyperuricemia. 395 548 J06
6. Gout—causes. 395 548 J05(RS2), D01

Contd...

Contd...

	STNRN	VSDN	
7. What is the normal serum uric acid level? Name two pathological conditions associated with hyperuricemia.	395	548	D02
8. Allopurinol.	398	549	J98
9. Lesch-Nyhan syndrome—causes, features.	399	549	J10(RS2), D14(RS3), D03, J08, J15
10. Identify the sources of carbon and nitrogen atoms of pyrimidine ring.	400	550	D13
11. Deficiency features of orotic aciduria. Explain the biochemical basis of manifestations.	402	551	J11(RS2), J07, J10, D16

CHAPTER 18: MINERAL METABOLISM

Long Essays

- Describe in detail the sources, daily requirement, absorption, distribution, functions, normal level and factors regulating blood calcium level. Discuss about any clinical condition with abnormal blood calcium level (tetany).
- Explain the metabolism of iron under the following headings. (a) Absorption and transport, (b) Biochemical functions, (c) Hemosiderosis.

Short Essays

- List any three trace elements with their biological function.
- Calcium—sources, daily requirements, factors affecting absorption, biochemical role (functions) and deficiency signs of calcium.
- Intestinal absorption of calcium.
- Calcium homeostasis (regulation of blood calcium level)—by vitamin D, PTH and calcitonin.
- Write briefly about the role of parathyroid hormone in the regulations of serum calcium level.
- Renal rickets.
- Give an account of phosphorus metabolism.

Contd...

Contd...

	STNRN	VSDN	
8. What are the major biochemical functions of sodium and potassium? Mention their normal serum levels.	413, 414	414, 415	D12(RS3), D03
9. What is the normal range of serum potassium and write about hypokalemia.	414	415	D10(RS2)
10. Iron—source, daily requirement, absorption, factors affecting iron absorption, transports, storage and physiological role of iron.	416	499	J07(RS2), D12(RS3), D16(RS3), D98, D99, D02, J04, J07, J10, J13, D15
11. What are the causes and consequences of iron toxicity?	419	502	D16
12. What is Wilson's disease? State the cause and treatment policy.	420	503	D17(RS3)
13. Functions of iodine.	420	504	J11(RS2)
14. Functions of selenium.	423	504	J10 (RS2)
Short Answers			
1. What is renal tubular acidosis? Mention two biochemical findings in this condition.	—	—	J02
2. Trace elements.	405	491	D06(RS2), D08(RS2)
3. Functions of calcium.	406	492	J11, D16
4. What is the normal serum calcium level? Explain its regulation.	409	493	D05(RS2), J05
5. List the hormones in plasma calcium regulation.	409	493	D06
6. Calcitriol.	409	493	J98
7. Write short note on rickets.	411	—	J13
8. Functions of magnesium.	412	498	J09
9. Hyponatremia (causes).	414	414	J98
10. Describe the functions of potassium.	414	415	J05
11. Iron—absorption, transport and storage.	417	499	D10(RS2), D00, D10
12. Ferritin.	418	500	D08
13. What is hemosiderosis? How it is caused?	419	502	—
14. Causes of hemochromatosis.	419	503	J01, D04
15. Functions of copper.	419	503	J12(RS3), D09
16. Copper-containing protein and its clinical significance.	419	503	J98

Contd...

Contd...	STNRN	VSDN	
17. Four enzymes <u>with copper as integral</u> component.	419	503	D12(RS3), J02, D08
18. Menke's disease.	420	503	J12(RS3)
19. Wilson's disease.	420	503	J00
20. Importance of iodine.	420	634	J14(RS3)
21. Iodine metabolism.	421	634	D07(RS2)
22. Biological role of zinc in the body.	421	504	J06(RS2), D98, J99, J08, J10, J12, J14
23. Name a zinc-containing enzyme and its catalytic role.	421	504	D05
24. Fluorosis.	423	504	J08(RS2)
25. Functions of fluoride in dental health.	423	504	J07
26. Metabolic role of selenium.	423	504	J18(RS3), D99, D08, J15
27. Mention the functions of (a) Iodine, (b) Zinc.	420, 421	634, 504	D01
28. Describe the functions of iodine and fluorine.	420, 423	634, 504	J05
29. Functions (metabolic roles) of zinc and selenium.	421, 423	504	J05(RS2), J01, D04

Section 4: CLINICAL BIOCHEMISTRY AND NUTRITION

CHAPTER 19: HORMONES

Short Essays

1. General mechanism of action of steroid hormones.	430	632	J08(RS2)
2. Give a diagrammatic representation of mechanism of steroid hormone action.	432	625	D12(RS3)
3. Significance of aldosterone.	444	632	J99, D04

Short Answers

1. Thyroid function tests—routine and anti-thyroid peroxidase antibody (TPO).	—	637	D11(RS3)
2. What is second messenger? Give an example.	430	622	D11
3. Mechanism of action of steroid hormones.	430	632	D14(RS3)
4. Give a diagrammatic representation of action of a steroid hormone.	432	625	J05
5. Cyclic AMP—functions.	432	623	D03
6. Reference range of TSH and its significance.	442	637	D11

Contd...

Contd...

	STNRN	VSDN	
7. Clinical interpretation of estimation of thyroid stimulating hormone (TSH) in blood.	442	637	D09(RS2)
8. Laboratory diagnosis for hypothyroidism.	443	638	J16(RS3)
CHAPTER 20: ORGAN FUNCTION TEST			
Short Essays			
1. Liver function tests (based on secretory/ metabolic and excretory functions).	454	357	D08(RS2), J14(RS3), J98, J01, D03, J06, J10, D10, J11
2. Vander Bergh's reaction (principle) and its clinical significance.	456	359	D00, J13, J15
3. Serum enzymes estimated to assess the liver function.	456	362	D98
4. Hippuric acid test.	460	—	D15
5. Describe renal function tests.	460	370	J02, J05
6. Clearance tests.	462	373	J06(RS2), J15
7. Define renal clearance. Name clearance tests used to assess kidney function. Explain any one of the clearance tests and mention its significance.	462	373	D05(RS2)
8. Creatinine clearance test.	462	374	D08
9. Standard urea clearance test.	463	376	J12(RS3)
10. Concentration dilution test.	463	379	D15
Short Answers			
1. Test for urobilinogen.	—	360	J99
2. Enumerate three/four functions of the liver and tests with reference ranges to assess them.	455	358	D11(RS3), D07
3. Describe Vander Bergh's reaction. Mention its significance.	456	359	J18(RS3), D18(RS3), J99, J04, D14
4. Write short note on enzyme assays for liver function/Marker enzymes of liver function test.	456	362	D16(RS3), D13
5. Enumerate renal function tests.	460	370	J11(RS2), D03
6. Tests to assess renal tubular function.	461	378	J17(RS3)
7. Tests of renal distal tubular function.	—	378	J16(RS3)
8. What is meant by renal clearance? How is creatinine clearance calculated?	462	374	D14(RS3)
9. Clearance tests.	462	374	D06(RS2)

Contd...

Contd...

	STNRN	VSDN	
10. Creatinine clearance test.	462	374	J09(RS2), J13(RS3), D14
11. Alkaline tide.	465	364	D98
CHAPTER 21: WATER, ELECTROLYTE AND ACID-BASE BALANCE			
Long Essays			
1. What is the normal pH of blood? Explain the mechanism of how it is regulated.	475	397	J12(RS3)
2. What is the importance of maintaining acid-base balance in the body? Write in detail how kidney helps in maintaining acid-base balance.	475	397	D07(RS2)
Short Essays			
1. Discuss the regulation of water by rennin-angiotensin system.	—	412	D17(RS3)
2. Define pH and buffer. Mention the buffer systems present in plasma, erythrocytes and urine.	476	396, 398	J02
3. What are buffers? Name the buffer system of body fluids. Discuss any one/two buffer system of the body.	476	396	D05(RS2), J13(RS3)
4. What are buffers? Explain the plasma buffers in maintaining acid-base balance.	476	396	J16(RS3), D18(RS3)
5. Blood buffers and their role in acid-base balance.	476	398	J06(RS2), D99, J06
6. Extracellular buffers.	476	398	J10(RS2)
7. Bicarbonate buffer system of blood.	476	398	J09(RS2)
8. What is Henderson-Hasselbach equation? Describe the buffer systems in blood and urine.	477	396	J05
9. Write the Henderson-Hasselbach equation and its significance in bicarbonate buffer system.	477	396	J14(RS3)
10. Use of phosphate buffer in maintaining acid-base balance.	477	398	D10
11. Renal regulation and respiratory regulation of body pH.	477	399	D00, D01, D03
12. Role of lungs in pH maintenance (respiratory regulation of pH).	477	399	D08
13. Erythrocytes in acid-base balance.	478	399	J18(RS3)
14. Chloride shift.	478	—	J08(RS2)

Contd...

Contd...

	STNRN	VSDN	
15. Renal regulation of acid-base balance (give the key reactions of renal mechanism in acid-base balance).	478	399	D06(RS2), D09(RS2), D11(RS3), D12(RS3), J15(RS3), J09, J12, J14, D14
16. What is anion gap? Explain normal anion gap acidosis and high anion gap acidosis with examples.	482	403	J05(RS2), D10(RS2), D09
17. How does metabolic alkalosis differ from respiratory alkalosis. Explain the cause and compensatory mechanism involved?	483	404, 405	J00
18. Metabolic acidosis—causes, biochemical findings.	483	403	J08(RS2), J98, J11
19. Explain metabolic and respiratory acidosis.	483	403, 405	J07(RS2)
20. What are the causes of respiratory acidosis? List the primary abnormalities of respiratory acidosis.	483	405	D14(RS3), J01
21. Respiratory alkalosis.	484	405	D15(RS3)
22. Hormonal regulation of fluid and electrolyte.	470, 473	411	D11(RS3), D16
23. What are buffers? Explain the role of the kidneys in homeostasis of pH of blood.	476, 478	396, 399	D11
Short Answers			
1. Hormones that regulate water balance.	470	411	J15(RS3)
2. Name the serum electrolytes and give their normal values.	472	411	D01
3. Define buffers. Name the blood buffer system.	476	396	J00, J01, D04, J08, D14
4. What are buffers? Write the importance of bicarbonate buffer system?	476	396	D13, J15
5. List the major kidney mechanism for regulation of pH of extracellular fluid.	478	399	D09
6. Carbonic anhydrase.	478	399	D99, D15
7. Discuss the role of carbonic anhydrase in the acid-base regulation.	478	400	D17(RS3)
8. Chloride bicarbonate shift.	478	—	D98
9. Reclamation of bicarbonate by kidneys.	479	400	J01, D04
10. Titrable acidity.	479	401	J99, D99
11. Give an account of anion gap.	482	403	J14

Contd...

Contd...

	STNRN	VSDN	
12. What is anion gap? Mention two causes for increased anion gap?	482	403	J03
13. Define anion gap. What happens to anion gap in acidosis resulting from renal failure?	482	403	J07
14. Metabolic acidosis—causes and features	483	403	J04
15. Respiratory acidosis—define, causes, compensation.	483	405	J10, D13
16. Alkalosis.	483	404	D16(RS3)
17. Explain why acidosis causes hyperkalemia? How it is corrected?	484	404	J03

CHAPTER 22: TISSUE PROTEINS AND BODY FLUIDS

Short Answers

- | | | | |
|---|-----|-----|----------|
| 1. Amino acids in collagen. | 488 | 672 | D99 |
| 2. Discuss the nutritional role of milk and dairy products. | 495 | 421 | D17(RS3) |

CHAPTER 23: NUTRITION

Short Essays

- | | | | |
|--|-----|-----|---|
| 1. Basal metabolic rate (BMR)—definition, determination, normal value, factors affecting. | 502 | 512 | J06(RS2), D07(RS2), J09(RS2), D13(RS3), J18(RS3), D18(RS3), J08, J09, J12 |
| 2. What is meant by dietary fiber? What are the sources of dietary fibers? Discuss the importance of it in nutrition. Outline the functions of proteins. | 507 | 514 | D14(RS3), J15(RS3) |
| 3. Nitrogen balance—factors affecting. | 509 | 515 | J05(RS2), J11(RS2) |
| 4. Define biological value of protein. What do you mean by complementary proteins? Give examples. What is the requirement of protein in diet? | 511 | 516 | J17(RS3), J14 |
| 5. What is a balanced diet? Discuss the components of a balanced diet. | 513 | — | J15(RS3), D13 |
| 6. Protein-energy malnutrition. | 514 | 516 | J10(RS2), D11(RS3), D08 |
| 7. Describe the causes and features of kwashiorkor and marasmus. | 515 | 517 | J05 |

Contd...

Contd...

275

Short Answers

- | | | | |
|--|-----|-----|--|
| 1. Calorific value—definition, calorific value of protein and fat. | 501 | 511 | D02 |
| 2. Respiratory quotient (RQ)—definition, RQ values of carbohydrate, lipids and proteins, factor affecting, conditions associated with lowering RQ. | 501 | 511 | J10(RS2), D01, J04, J05, D05, D10, D14, D15 |
| 3. Basal metabolic rate (BMR)—definition, factors affecting, causes of increased BMR. | 502 | 512 | J02, J04, D09, J10 |
| 4. Specific dynamic action (SDA) and basal metabolic rate (BMR). | 502 | 512 | D12(RS3) |
| 5. Specific dynamic action of food stuff. | 503 | 512 | J12(RS3), J15(RS3), J16(RS3), D07, D12, J15 |
| 6. Calculate energy requirement per day of a student of 20 years. | 504 | 513 | J13 |
| 7. Dietary fiber—sources, examples, beneficial effects (role in health and disease). | 507 | 514 | D07(RS2), D08(RS2), J10(RS2), D10(RS2), D18(RS3), J00, J01, J02, D04, D10, J13 |
| 8. Nitrogen balance. | 509 | 515 | D11 |
| 9. Positive nitrogen balance. | 510 | 515 | D10 |
| 10. Biological value of protein. | 511 | 516 | J15 |
| 11. Limiting amino acid. | 512 | 516 | J08(RS2) |
| 12. Balanced diet. | 513 | — | J16(RS3), J98, D99, D13 |
| 13. Nutritional deficiency disorders in India. | 514 | 516 | D07 |
| 14. Protein-energy malnutrition (biochemical changes). | 514 | 516 | J07(RS2), D10(RS2), D16(RS3), J13 |
| 15. Kwashiorkor—biochemical findings. | 515 | 517 | D02, D15 |
| 16. Marasmus. | 515 | 517 | D98, J06 |
| 17. Nutritional deficiency anemias. | 515 | 501 | D05(RS2) |
| 18. List two differences between marasmus and kwashiorkor. | 516 | 517 | D01 |

Contd...

Contd...

STNRN VSDN

Section 5: MOLECULAR BIOLOGY AND BIOTECHNOLOGY

■ CHAPTER 24: DNA—REPLICATION, RECOMBINATION AND REPAIR

Long Essays

1. Discuss the structure and replication of DNA. 76, 524 556, 559 J10(RS2)
2. Describe the synthesis of DNA. Write a note on replication of DNA. 524 559 D15(RS3)
3. Define replication. Describe in detail the process of replication in eukaryotes. Mention its inhibitors. 527 559 D14(RS3), J16(RS3)*
4. Write about DNA replication and repair. 524, 535 559, 562 J13

Short Essays

1. What is meant by exonucleases and endonucleases? Write the importance of each. — 563 J01
2. What is replication? Describe the steps of replication. 524 559 D00, D02, D07
3. Describe the replication of DNA. 527 559 J05
4. Replication of lagging strand. 528 561 D07(RS2)
5. Mutations (point mutation). 534 591 J05(RS2)
6. Point mutation—define and effects. 534 591 D17(RS3)
7. Base excision DNA repair mechanism. 536 564 J10

Short Answers

1. Name bacterial DNA polymerases. Mention its significance. — 560 D05(RS2)
2. Replication of DNA. 524 559 D98, J09
3. What is meant by semiconservative mechanism of replication? 524 559 J10
4. Okazaki fragments. 525 562 J17(RS3), D18(RS3), J15, D16
5. Cell cycle. 530 594 J17(RS3)
6. What is mutation? List two examples. 534 591 J02, D14
7. Mutagens. 534 593 J17(RS3)
8. Point mutation with two examples. 534 591 J15(RS3), D15(RS3), J12
9. Silent mutation. 534 592 J15
10. Missense mutation—list the effects. 535 592 J10, D15
11. What is nucleotide excision repair? 536 563 J07
12. Causes for xeroderma pigmentosa. 536 564 D12(RS3)

Contd...

Contd...

STNRN VSDN

■ CHAPTER 25: TRANSCRIPTION AND TRANSLATION

Long Essays

1. Give a detailed account of the eukaryotic transcription process. How is it regulated? Name the inhibitors of transcription. 543, 545 570, 574 J14
2. Define translation (protein biosynthesis). Describe the steps of translation. Name four inhibitors and their action. 546, 581, 584 J14(RS3), J17(RS3)*
3. Explain the process of translation. Add a note on post-translational modifications. 549, 557 581, 584 D18(RS3)
4. What is genetic code? Describe the process of eukaryotic translation. 546 580, 581 J11(RS2)
5. What is lac-operon? Explain the steps of activation, initiation, elongation and termination of protein biosynthesis and its regulation. 562, 550 595, 581 J05(RS2), D08(RS2), D10(RS2), D11

Short Essays

1. Transcription (factors required). 540 570 D06(RS2), D01, J06
2. Post-transcriptional modifications of mRNA. 544 572 D09(RS2), D16(RS3), J10, D12
3. Genetic code—definition (Codon), salient features, initiating and terminating codon. 546 580 D06(RS2), J08(RS2), J17(RS3), D17(RS3), D03, J15
4. Write part played by ribosomes in proteins biosynthesis. 549 579 J00
5. Post-translational modification. 557 584 D15

Short Answers

1. RNA polymerase. 543 570 D16(RS3), D15
2. Name the post-transcriptional modifications of m-RNA. 544 572 D06
3. Name two inhibitors of RNA synthesis. 545 574 D05
4. Reverse transcriptase and its significance. 546 573 J01, J03, D04, J06
5. Codon and its characteristics. Name the chain initiating codon and chain terminating codons. 546 580 J99, D99, J05, D07

Contd...

Contd...

	STNRN	VSDN	
6. Genetic code—characteristic features.	546	580	D09(RS2), D10(RS2) ✖
7. Write short note on codon and 'Wobble hypothesis'.	546, 548	580	D13
8. Degeneracy of codon.	547	580	J01, D04, D09
9. Wobble phenomenon.	548	580	J15
10. Which are inhibitors of protein biosynthesis?	555	584	J07(RS2)
11. Post-translational modifications with examples.	557	584	J13(RS3), D07

■ CHAPTER 26: REGULATION OF GENE EXPRESSION

Short Essays

1. Describe with an example regulation of gene expression. 561 595 D13(RS3)
2. Lac-operon concept of gene regulation. 562 595 D17(RS3), J11

Short Answer

1. Operon concept. 562 595 D11(RS3)

■ CHAPTER 27: RECOMBINANT DNA TECHNOLOGY

Long Essay

1. Discuss in detail recombinant DNA technology and its clinical application. 571 600 J08(RS2)

Short Essays

1. Recombinant DNA technology and its applications. 571 600 D08(RS2), J16(RS3), D16(RS3), J17(RS3), J03, J04, D08, D10, D15
2. What is the difference between endonuclease and restriction endonuclease? Give two examples for endonuclease. 601 D15(RS3)
3. What is a restriction endonuclease? Give any two examples with their biomedical importance. Explain their role in recombinant DNA technology. 572 601 J13(RS3), J16(RS3) ✖
4. What is plasmid? What is its application in recombinant DNA technology? 600 J07(RS2), J10
5. Explain the principle, requirements, steps of polymerase chain reaction and its application. 579 612 D14(RS3), D18(RS3), J15, D16

Contd...

Contd...

Short Answers

- | | STNRN | VSDN | |
|---|---------|------|---|
| 1. What is the difference between endonuclease and restriction endonuclease? Give two examples of restriction endonuclease. | 601 | | D08(RS2) |
| 2. What are restriction enzymes? List three features of restriction enzymes. | 601 | | D14(RS3) |
| 3. What are DNA probes? Mention the types of DNA probes. | 608 | | D17(RS3) |
| 4. What is a chimeric (recombinant) DNA molecule? Give the applications of recombinant technology. | 572 602 | | D09(RS2), D11(RS3), D05, D11, D12 |
| 5. What are restriction endonucleases? Give two examples. | 572 601 | | D03 |
| 6. What is a vector? What are the commonly used vectors in recombinant DNA technology? | 574 601 | | J18(RS3), J07 |
| 7. Southern Blot techniques. | 576 608 | | J14(RS3) |
| 8. What is Polymerase Chain Reaction (PCR)? Mention application of PCR. | 579 612 | | J05(RS2), J06(RS2), J09(RS2), J14(RS3), J04 |
| 9. What is restriction fragment length polymorphism? Give one clinical application for the same. | 583 611 | | J07 |

Section 6: CURRENT TOPICS

■ CHAPTER 28: HUMAN GENOME PROJECT

None

■ CHAPTER 29: GENE THERAPY

Short Essay

1. Gene therapy—its application in medicine. 602 604 D07(RS2), D13(RS3), D09, D12

Short Answer

1. What is gene therapy? Name vectors used for gene therapy. 602 604 D05(RS2), D18(RS3) ✖

■ CHAPTER 30: BIOINFORMATICS

None

Contd...

Contd...

STNRN VSDN

■ CHAPTER 31: METABOLISM OF XENOBIOTICS (DETOXIFICATION)

Short Essays

- | | | | |
|---|-----|-----|--------------------|
| 1. What are Xenobiotics? Give an account of phase two detoxification reactions. | 613 | 525 | D18(RS3) |
| 2. What is biotransformation? Discuss the different phases of biotransformation with an example. | 613 | 525 | J14(RS3) |
| 3. Detoxification with examples of reactions involved. | 613 | 525 | D05(RS2), J05, J13 |
| 4. Define detoxification. Give any four reactions of phase II detoxification. | 613 | 525 | J17(RS3) |
| 5. What is detoxification? Explain the role of oxidation and conjugation reactions in the liver for detoxification. | 613 | 525 | D11 |
| 6. Detoxification by oxidation. | 614 | 526 | J11(RS2) |
| 7. Detoxification by conjugation with examples. | 615 | 527 | D10 |

Short Answers

- | | | | |
|---|-----|-----|-------------------------|
| 1. How is paracetamol detoxified? | — | — | J08 |
| 2. What are xenobiotics? What is the role of Glutathione in detoxification. | 613 | 525 | D10(RS2) |
| 3. What is biotransformation? Give two examples. | 613 | 525 | D02 |
| 4. Detoxification. | 613 | 525 | D17(RS3), J11 |
| 5. Explain any one detoxification mechanism with an example. | 614 | 526 | D12 |
| 6. Detoxification reaction—phase I. | 614 | 526 | D14(RS3) |
| 7. Give two examples of detoxification by oxidation and reduction. | 614 | 526 | D09(RS2) |
| 8. Detoxification of alcohol. | 614 | 526 | J09(RS2) |
| 9. Role of cytochrome P450 in detoxification reaction. | 615 | 526 | D08(RS2), D14 |
| 10. How is aspirin detoxified? | 615 | 527 | D07 |
| 11. Conjugation as detoxification mechanism with two examples. | 615 | 527 | J06(RS2), J07(RS2), D98 |

■ CHAPTER 32: PROSTAGLANDINS AND RELATED COMPOUNDS

Short Essays

- | | | | |
|---|-----|-----|-----|
| 1. What are eicosanoids? Mention their biomedical importance. | 618 | 243 | J02 |
|---|-----|-----|-----|

Contd...

Contd...

STNRN VSDN

- | | | | |
|---|-----|-----|--------------------|
| 2. Prostaglandins—classification and biological action. | 620 | 243 | J09(RS2), D98, J07 |
|---|-----|-----|--------------------|

Short Answers

- | | | | |
|--|-----|-----|------------------------------|
| 1. Eicosanoids—names/functions. | 618 | 243 | D14(RS3), J08, D16 |
| 2. What are prostaglandins? Mention their biological functions. | 618 | 243 | D06(RS2), D13(RS3), D01, D10 |
| 3. What is arachidonic acid? Mention two uses of arachidonic acid. | 619 | 242 | J10 |

■ CHAPTER 33: BIOLOGICAL MEMBRANES AND TRANSPORT

Short Essays

- | | | | |
|--|-----|----|-------------------------|
| 1. Cell membrane—fluid mosaic model. | 623 | 13 | D09(RS2), D17(RS3), J14 |
| 2. Different transport mechanisms across the cell membrane. | 624 | 15 | J18(RS3), D09, J11 |
| 3. Facilitated diffusion. | 625 | 15 | D10 |
| 4. Define active transport. Explain the different types of active transport with suitable examples. | 626 | 17 | D18(RS3), J15 |
| 5. Sodium-potassium pump. | 626 | 17 | J10 |
| 6. Classify transport mechanisms across cell membranes. Define uniport, symport and antiport. Give an example of each. | 627 | 19 | D11(RS3) |

Short Answers

- | | | | |
|---|-----|----|---------------|
| 1. Cell membrane—functions. | — | 13 | D07(RS2), J09 |
| 2. Describe secondary active transport. Mention one disorder of secondary active transport. | — | 17 | J05 |
| 3. Write four structural features of cell membrane. | 623 | 13 | J13 |
| 4. Transport across cell membrane. | 624 | 15 | D15(RS3) |
| 5. Define the term active and passive transport. | 625 | 15 | J13 |
| 6. Active transport. | 626 | 17 | J11(RS2), D06 |
| 7. What is uniport and symport transport system? Give an example. | 627 | 19 | D11 |
| 8. Endocytosis. | 628 | 19 | D08, J11 |

Contd...

Contd...

STNRN VSDN

CHAPTER 34: FREE RADICALS AND ANTIOXIDANTS

Short Essays

- | | | | |
|--------------------------|-----|-----|--------------------|
| 1. Antioxidants. | 632 | 429 | J08(RS2), J99, D04 |
| 2. Antioxidant vitamins. | 632 | 429 | D06 |

Short Answers

- | | | | |
|--|-----|-----|--|
| 1. Free radicals—definition, generation, functions. | 629 | 425 | J05(RS2), J12(RS3), D10 |
| 2. Reactive oxygen species (ROS)—enumerate, formation, characteristics. | 630 | 425 | D08(RS2), D10(RS2) |
| 3. Free radicals and disease. | 631 | 427 | J11(RS2) |
| 4. Free radical scavenging systems. | 632 | 426 | D18(RS3) |
| 5. Antioxidants with examples. | 632 | 429 | D06(RS2), D11(RS3), D12(RS3), J15(RS3), D98, D03 |
| 6. What are antioxidants? Name chain breaking and preventive antioxidants. | 632 | 429 | J07(RS2) |
| 7. Nonenzymatic antioxidants. | 632 | 429 | J16(RS3) |
| 8. Mention the dietary antioxidants. | 632 | 429 | J14 |

CHAPTER 35: ENVIRONMENTAL BIOCHEMISTRY

Short Answer

- | | | | |
|--|-----|-----|-----|
| 1. What are the effects of lead poisoning on heme synthesis? | 638 | 328 | J14 |
|--|-----|-----|-----|

CHAPTER 36: INSULIN, GLUCOSE HOMEOSTASIS AND DIABETES MELLITUS

Long Essay

- | | | | |
|---|-----|-----|-------------------------|
| 1. What is the normal blood glucose level? Why does it need to be regulated? Describe the regulation of blood glucose. What are the causes of hyperglycemia and hypoglycemia? | 646 | 159 | D09(RS2), D14(RS3), D03 |
|---|-----|-----|-------------------------|

Short Essays

- | | | | |
|--|-----|-----|---------------|
| 1. Regulation of blood sugar. | 646 | 159 | D12 |
| 2. Mechanisms of action of glucagon. | 646 | 167 | D07(RS2) |
| 3. Explain the role of hypoglycemic hormones (insulin) in regulation of blood glucose. | 648 | 166 | J05(RS2) |
| 4. Glucose tolerance test (GTT). | 652 | 162 | D02, J07, D09 |

Contd...

Contd...

STNRN VSDN

- | | | | |
|---|-----|-----|--------------------|
| 5. Diabetes mellitus (metabolic changes). | 654 | 170 | D08(RS2), D12(RS3) |
|---|-----|-----|--------------------|

Short Answers

- | | | | |
|---|-----|-----|------------------------------|
| 1. Glucose tolerance test (GTT) graph for renal glycosuria. | — | 163 | D11(RS3) |
| 2. Name two physiological actions of insulin. | 643 | 166 | D05 |
| 3. Intracellular insulin receptor. | 644 | 165 | J06(RS2) |
| 4. What are metabolic effects of glucagon? | 645 | 167 | J04 |
| 5. How does insulin regulate blood glucose? | 648 | 166 | D13 |
| 6. Name the insulin antagonists. | 648 | 167 | D01 |
| 7. Glucose tolerance test. | 652 | 162 | J11 |
| 8. What are the features of a normal glucose tolerance curve? | 652 | 163 | J10 |
| 9. What is glycosuria? Mention the causes of different types of glycosuria. | 653 | 164 | J04 |
| 10. Renal threshold for glucose and its significance. | 653 | 164 | D10(RS2) |
| 11. Renal glycosuria. | 653 | 164 | J10(RS2), J99, J12, J14, J15 |
| 12. What is renal glycosuria? How do you differentiate it from diabetic glycosuria? | 653 | 164 | J03 |

CHAPTER 37: CANCER

Short Essays

- | | | | |
|--|----------|-----|---------------|
| 1. What are oncogenes? Discuss two tumor markers and their clinical application. | 659, 662 | 664 | D15(RS3) |
| 2. Proto-oncogenes and oncogenes (mechanisms involved in activation of proto-oncogenes to oncogenes). | 660 | 664 | D10(RS2), D16 |
| 3. Tumor markers. | 662 | 666 | J07(RS2) |
| 4. Clinical importance of alpha-fetoprotein (AFP) and prostate-specific antigen (PSA). Give their normal values. | 663 | 667 | D12(RS3) |

Short Answers

- | | | | |
|-------------------------------------|-----|-----|----------|
| 1. Mechanism of carcinogenesis. | — | 661 | D09(RS2) |
| 2. Plasmids and oncogenes. | — | 664 | D13(RS3) |
| 3. Prostate specific antigen (PSA). | — | 668 | J08(RS2) |
| 4. Chemical carcinogens. | 658 | 662 | D16 |

Contd...

Contd...

	STNRN	VSDN	
5. Oncogenes—definition, examples, role in carcinogenesis.	659	664	J05(RS2), D06(RS2), D11(RS3), D18(RS3), J04, J06, J09
6. Growth factors—enumerate, functions, role in carcinogenesis.	661	666	D05(RS2), D07(RS2)
7. Tumor markers—definition, examples, diagnostic significance.	662	666	D08(RS2), D14(RS3), D15(RS3), J18(RS3), D02
8. Anticancer agents.	664	668	D13(RS3)

■ CHAPTER 38: ACQUIRED IMMUNODEFICIENCY SYNDROME

None

Section 7: BASICS TO LEARN BIOCHEMISTRY

■ CHAPTER 39: INTRODUCTION TO BIO-ORGANIC CHEMISTRY

None

■ CHAPTER 40: OVERVIEW OF BIOPHYSICAL CHEMISTRY

Short Essay

1. Radioactive isotopes of iodine and their clinical application. 685 683 D10(RS2)

Short Answers

1. How does a buffer maintain the pH? Give an example of blood buffer. 679 398 D06
2. Define radioactivity. Name the uses of:
a. ^{131}I .
b. Co-60. 685 681, 682 D01
3. Radioisotopes. 685 680 D13(RS3)
4. Mention two isotopes and mention their application in medicine. 685 682 D08(RS2), D03, J07

■ CHAPTER 41: TOOLS OF BIOCHEMISTRY

Short Essays

1. Chromatography. 687 434 J00
2. Electrophoresis. 690 432 D00

Short Answers

1. Principle of chromatography. 688 434 J15

Contd...

	STNRN	VSDN	
2. Electrophoresis—principle, normal pattern of serum proteins, diagnosis importance.	690	432	D15(RS3), D16(RS3), D03, J10, J12
3. Immuno-electrophoresis.	691	433	J08(RS2)
4. Monoclonal antibodies.	696	669	J14(RS3)

■ CHAPTER 42: IMMUNOLOGY

None

■ MISCELLANEOUS

Long Essay

1. Discuss the significance of multi enzyme complexes with respect to carbohydrate and lipid metabolism. — — J06(RS2)

Short Essays

1. Multienzyme complexes. — — D07
2. How would you explain osteoporosis in following conditions? — — J01
- Prolonged use of phenobarbitone
 - Chronic liver or renal disease
 - Vitamin D resistant rickets
 - Fanconi's syndrome
 - Vitamin D dependent rickets type II.

Short Answers

1. Indicate the biochemical defect in lactose intolerance and Gilbert's disease. 171, 216 127, 333 D13
2. Name the enzyme defects in the following cases: (1) Refsum's disease, (2) Alkaptonuria. 294, 353 198, 293 D13
3. GABA, PUFA and SAM and their importance. 371, 30, 277, 361 240, 272 J14(RS3)
4. Name two inborn errors of metabolism and the associated enzyme. 377 — J09
5. Abnormal components of urine. 729 372 D13(RS3)
6. Define proteinuria. Mention a biochemical test to detect proteinuria. — 377 J14
7. What are G-proteins? — 622 J14
8. Multienzyme complex. — — D17(RS3)
9. What are cold agglutinins? — — D05

Contd...

Contd...

	STNRN	VSDN
10. What is reference range/values? How is it calculated?	—	—
11. Achylia gastrica.	—	—
12. Reference range of potassium and albumin in the serum.	—	—
13. Normal values of:	—	—
a. Serum creatinine (0.5–1.5 mg/dL).		
b. Serum amylase (80–180 somogyi units/dL).		
14. Mention the normal serum values for:	—	—
a. AST (4–45 IU/L).		
b. ALT (3–40 IU/L).		
c. Urea (15–40 mg/dL).		
d. Creatinine (0.5–1.5 mg/dL).		
15. Normal serum levels of:	—	—
a. Serum calcium (9–11 mg/dL).		
b. Serum phosphorus (3–4.5 mg/dL).		
16. Mention the normal levels of:	—	—
a. Serum protein (6–8g/dL).		
b. Urea (15–40 mg/dL).		
c. Creatinine (0.5–1.5mg/dL).		
17. Give the normal blood level of the following:	—	—
a. Fasting blood glucose (70–100 mg/dL)		
b. Total protein (6–8g/dL).		
c. Urea (15–40 mg/dL).		
d. Bicarbonate (24–30 mEq/L).		
e. Sodium (135–145 mEq/L).		
f. Potassium (3.5–5 mEq/L).		
18. Give the normal values of:	—	—
a. Fasting blood glucose (70–100 mg/dL).		
b. Cholesterol (150–200 mg/dL).		
19. Name the normal Serum levels of:	—	—
a. Sodium (135–145 mEq/L).		
b. Potassium (3.5–5 mEq/L).		
20. Give the normal values of:	—	—
a. Fasting blood glucose (70–100 mg/dL).		
b. Blood urea (15–40 mg/dL).		

D07(RS2),
J16(RS3)

J98

D09

D99

J02

J06, D08

D06(RS2)

J09(RS2)

D13

J14

D14